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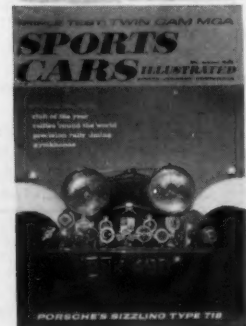
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# SPORTS CARS ILLUSTRATED

october 1958

no. 4 vol. 4



That load of badges signifies that this issue is intended to appeal to the guy in the smaller club who just uses his car for fun. Kodachrome by Fred Bull.

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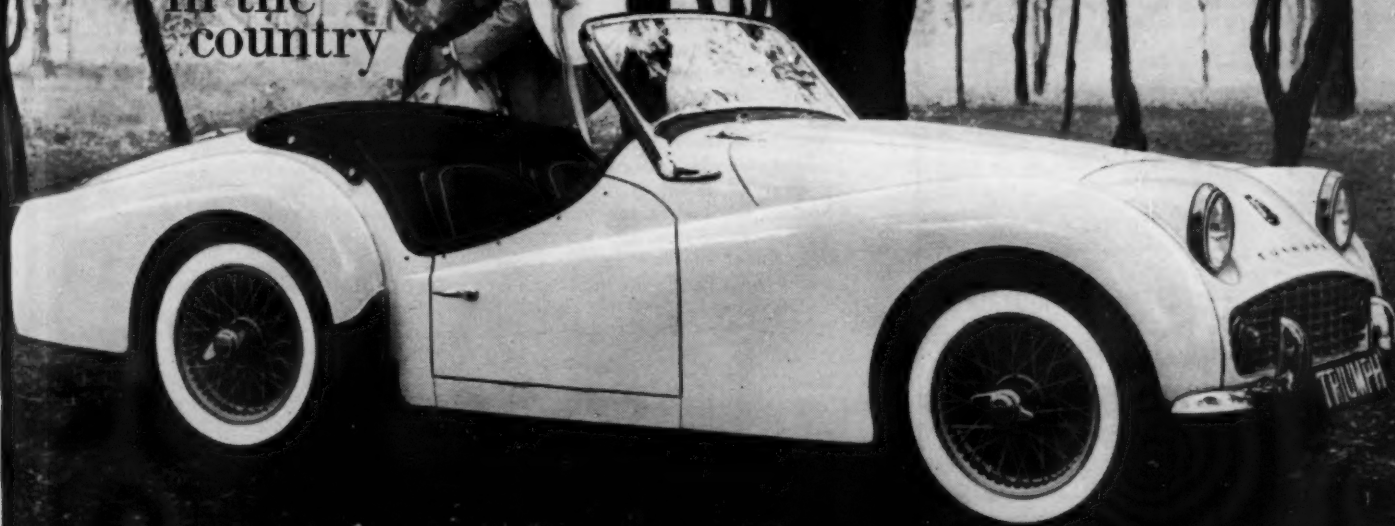
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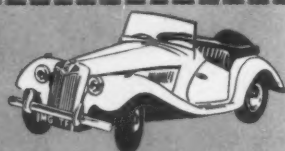
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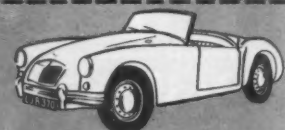
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# very sincerely yours:

**T**HE SHORT, bandy-legged stocky man spoke only Spanish and Italian with a smattering of English, French and a word or two of strangely accented German but he made himself quite clear to his largely English-speaking audience, consisting of deponent, Griff Borgeson and a couple of friends.

We were having coffee in the restaurant of the St. Moritz hotel and the talk got around from racing *per se* to writing about racing. In his high-pitched voice, the man said: "If one is to write intelligently about racing, one must have raced. There is no other way."

The speaker was an Argentinian gentleman of some note — a Mr. Juan Manuel Fangio, who until this year more or less owned the Grand Prix Championship of the World on what was beginning to look like a permanent basis.

We were happy to be able to tell the gentleman from Argentina that a goodish percentage of the SCI staff has indeed raced and that at least two of us were active in the sport as of the moment. The oldest hand at it is, of course, Dennis May, who is quite a wheel in the super-exclusive British Racing Drivers' Club and holder of one of the last records made at Brooklands. Technical Editor Steve Wilder has been running various sorts of machines with various sorts of success both here and in England. Currently Steve is giving Carrera owners fits with a 1954 Porsche Super coupe. Deponent is, through the kind offices of Hambro Automotive Corp. and a local bank, enjoying a modicum of success with an Austin-Healey 100-6, a muscular machine that shows what can be done when the options provided by Mr. Healey are properly installed. Others on the staff are headed for their competition licenses, too. When you come right down to it SCI can field quite a *scuderia*. Biggest of the machines is the Austin-Healey, next is Don Typond's TR-3A, then comes Steve's Porsche, the Editor's ancient ditto, Ev Clark's Speedster and Len Griffing's Sprite. Oh yes, we forgot; there's also Griff Borgeson's Arnolt Bristol. Readers and the SCCA please note that these are driven daily — there isn't a trailer in the bunch. Nor is there a sedan of any description.



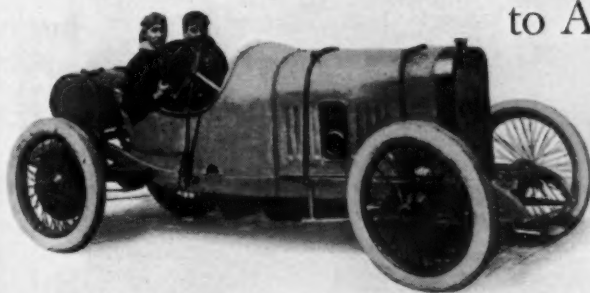
Steve Wilder heads for a second place in F Production at Wilkes-Barre in the '54 Porsche. Christy charges up the Lime Rock serpentine on his way for a first in class D and second overall in the Sebring Healey.

Speaking of trailers and such, this month we bring you a car that is definitely not street equipment — the newest Porsche stormer, sometimes mis-called the RSK and known officially as the Type 718. This is the machine that continues the Porsche idea that ingenuity and a few rectangular Reichsmarks can still make trouble for lots of cubic inches. Without even bothering with technicalities like handicap and Index of Performance, the men from Stuttgart are forever bringing one or more of their pint sized sizzlers into third or fourth spot against red-hot stuff twice their size. Steve Wilder, who readers may have gathered is somewhat enamored of the product, has dug up the scoop on their latest weapon, starting on page 32. For what appears to be the beginning of another small-bore sizzler, check page 18 for the test on what was really a test vehicle — the new Twin Cam MGA. This test procedure isn't finished either — we're still working on it in various combinations with the help of the importer and Ed Brown, the man who sets up BMC's racing stables when they compete in the U.S. at such out-of-the-way corners as Sebring. There'll be more to come on this fascinating machine in a month or two. By the time we get through, if you're partial to the Marque of the Octagon, you'll be able to set up a winner and at a price that won't keep you in peonage for life. Stick with us and see.

— john christy



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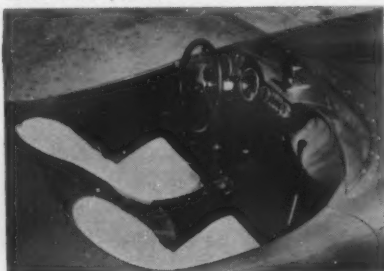
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OCTOBER '58



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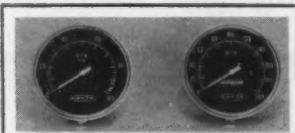
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## letters

### FAMILY TREE

I'm a bit confused over the genetics of BMC's latest, the Austin Healey Sprite. On page 44 of your August issue you state that it comes from the fertile minds of Donald Healey and son Geoff; on page 6 Very Sincerely Yours you say that you've just wrung out Donald Healey's latest brain child.

This made good sense until I picked up another magazine and read that the Sprite wasn't designed and will not be built by Donald Healey.

Just who is this prodigy's proud papa anyway?

Lloyd Spencer  
Chicago, Ill.

As far as we've been able to learn, Donald and son did have quite a bit to do with it — that's what BMC pays them for. —Ed.

### UBIQUITOUS A-U

I have read your story of the Auto Union cars. You stated that "... an empty shell of one prewar grand prix engine. . .". I do not know where this engine is, but I have seen a complete car except for the body in the Deutschen Museum in Munich, Germany. The car seems to need nothing more than fuel to have it running again. Alongside of it is a 1938 Mercedes-Benz.

S/Sgt. Robert T. Allen  
U.S.A.F.

Our technical editor has verified the fact that this chassis does exist, part of a tremendously varied collection of interesting vehicles. Incidentally the Deutschen Museum is interested in the acquisition of one of the first models of the Ford V-8 engine. We would appreciate it if any reader who knows of such an engine would contact us. —Ed.

### GP vs. OVAL

Let's face facts; GP racing and track racing are horses of a different color. Mr. Ridout, who seems to think GP racing is for kiddies, has a lot to learn. I used to be one of the people who believed somewhat along those lines until two years ago I purchased a Formula III Cooper. Both types of racing require a great deal of skill. Mr. Ridout should stop to think that a GP driver has more to worry about than an in-and-out gear box, standing hard on the throttle, and turning left. In the first place, on most circuits there are upwards of ten turns to both left and right, varying from right angle to hairpin to extremely fast sweeping bends. On the average the driver will have to shift two or three times up and down for each corner, and drifting a GP car through a crowded corner requires as much skill and fortitude as broadsliding a dirt track machine, especially when speed is in the neighborhood of 90 or better.

Any time Mr. Ridout cares to come to San Diego and try a ride in my kiddie



car we'll see if he can turn even a very slow 1:58 trip here at the Hourglass.

Robert L. Myers  
San Diego, Cal.

In your August issue you stated that Juan Fangio had qualified at Indianapolis. Mr. Fangio did not qualify, but left before the first day of qualifications. He did however obtain speeds up to one hundred-forty two miles per hour in practice. The reasons he gave for leaving were that he had not had enough time to get comfortably acquainted with the car, nor to the track. . . . I believe that in their own particular brand of racing, both the Americans and the Europeans are equal, and that, given enough time to practice in the other type, they could excell in all types of racing. . . . In time my beliefs may be proven somewhat by the entry of Troy Ruttman in many of the European events this year and next.

Gary L. Morningstar  
Bloomington, Ill.

*Fangio qualified himself, as a driver, for the Indy 500. Contractual difficulties prevented him from staying long enough to qualify his car. Whether or not he would have is in the realm of speculation, and you are welcome to your own opinions.*

—Ed.

In reference to a letter from Mr. Ridout, and your reply to same; there should be no comparison between the GP drivers such as Fangio, and our track drivers such as Bryan. Both are great in their own way, and each could no doubt adapt himself to the other's type of racing.

As for your erroneous and misleading answer, Mr. Editor, get the facts! Fangio did not qualify a car for the 500. Far from it. This was due more to the inability of the car than to Fangio himself. Also, the statement that his speed was only ". . . a few miles per hour off the track record" takes the cake. A few miles per hour at Indy is quite a lot when you think that fractions of a second can either make the program or leave you sitting in the garage area. The slower qualifiers were only "a few miles per hour slower than the track record". Sure the man can drive, but not with our men. Fangio would be as lost at Langhorn as he would be in a jet fighter.

I also get tired of your mag and another of the same type, always boosting European GP racing and drivers, and selling ours short. I enjoy GP stuff, but there is more than one side to the sport of men. We all should have some loyalty to the products of the USA. If you are so stuck on the Sporty Car Gang, why not peddle your papers on the other side of the Atlantic. I am sure that if Moss or Behra had won at Monza, you could have done quite a spread on the race. But I am sure that this subject does not agree with the "Hoorah for the Europeans" clan, so I shall close and step off my soap box. Thanks.

Lawrence Wright Jr.  
El Paso, Texas

*We are filing this letter between the Plymouth Fury and the Chevrolet Corvette Road Tests—Ed.*

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## TECHNOTES

### 1959 PORSCHE CONVERTIBLE

The Speedster is dead, long live the Convertible! Retaining only the Speedster's dashboard and gear ratios (numerically higher third and fourth), the new Convertible is basically a stark version of the lush Cabriolet. Just to confuse things, Porsche has been calling the latter a convertible recently to suit American terminology. Semantically, the difference is in the top's interior lining. The Cabriolet's is fully padded, the Convertible's is not. Both have roll-up windows, door pockets and contoured seats.

Differences are that the convert's windshield is removable all in one piece for racing, a full tonneau cover with a zipper down the middle is standard, while the popular reclining seat feature is optional. The tops of the doors taper down a bit at the rear and the entire rear deck is a shade lower. Inside, the rear seats (no seat backs here) are reshaped to discourage luggage from slipping too readily to the floor. These body stamping changes are permitted by Porsche's employment of an additional body maker, Drauss, who will make only Converts while Reutter will do only Coupes and Cabriolets (including Carrera deLuxe models but not GT's — it's dead too.)

The Hardtop, described in this issue's road test, will not fit the Convertible. Too bad, but no doubt someone in California will soon take care of that if Stuttgart doesn't. Available only with 1600 Normal and Super engines, the price will be about \$100 less than the equivalent Coupe; i.e., about \$250 more than the defunct Speedster. Since the taller windshield eliminates the major criticism of the latter, and wind-up windows are popular in anybody's language, this price increase seems merited if not exactly welcome. Truly a sports-touring car, this new Convertible should suit American tastes to a T.



### WHAT'S WATT INDEED

August's Technotes said that the outboard ends of the outer links in a Watts linkage should be the same height from the ground for vertical movement. Not so. In the neutral position, the outer links should both be parallel to the ground to obtain vertical motion. This neutral position should represent the static loaded location of the frame relative to the axle (the BRM was shown unloaded). The central pivot actually follows part of a tilted, elongated figure-eight path which is essentially straight near this neutral position. To lengthen the straight part of this path, the center link should not be any shorter than necessary. A little time spent with paper, pencil, ruler and compass will confirm all this. Sharpshooter awards to both Col. Ray Adams of Fort Belvoir and Sp3 David M. Dean of Redstone Arsenal.





what's new?

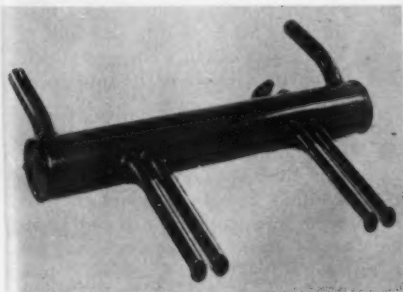
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## NEWSLETTER

**I**T WAS an exciting but sad French Grand Prix this year. Mike Hawthorn won his first GP since 1953 and Ferrari's first since '56, yet Italy lost its last great driver when Luigi Musso was killed. His *Dino* 246 left the road near the Muizon turn on a high speed bend that has already claimed the lives of Annie Bousquet and Mac Fraser. Three lives in three years, yet nothing has been done to this dangerous corner. Not only is there a curbing on the outside, there is also a ditch — to protect spectators, they say, though none are allowed within half a mile. The FIA should have a safety committee of drivers and track organizers to take care of such matters.

Hawthorne had a fine race; driving smoothly and brilliantly. In the lead from the start, he averaged 125 mph. After Musso's crash on the tenth lap, Moss and Behra became involved in a fantastic duel for second place, roaring up the main straight side by side, there being nothing between the two cars in hp or maximum speed. Fangio, running the new lightweight Maser, did not have the steam to keep up with the Ferraris and seemed to be slower even than the Vanwall. Fangio managed to get by Moss on several corners just by sheer bullying, and showed Stirling a thing or two, but on the whole the "old man" had to eat English dust. It was wonderful to see him at Reims; he was in top form and obviously enjoying himself. As a matter of interest, he drove the last half of the GP with a permanently engaged clutch, finishing fourth. Afterwards, he announced his retirement from racing.

Behra's BRM had more stopping power than Moss' Vanwall. Stirling locked up his rear wheels more than once trying to stop for the Thillois hairpin as Behra charged down behind him, gaining yards each time. The Vanwall would pull away coming off the hill towards Thillois but would lose this approaching the hairpin. Behra eventually broke his car with major engine failure so Moss captured second. This put him equal with Hawthorn for Championship points.

Troy Ruttman in a Scuderia Centro-Sud 250F Maserati drove steadily and safely, wanting to finish the race above all else. Troy's car was several years old so he was lapping at good F-2 speeds rather than competitive F-1 times. It was very fine to see him start a Grand Prix and he learned a lot from his experience. He ad-



## Results: Grand Prix de l'ACF:

Hawthorn	Ferrari	2:03'21.3"
Moss	Vanwall	2:03'45.9"
Von Trips	Ferrari	2:04'21.0"
Fangio	Maserati	2:05'51.9"
Collins	Ferrari	2:08'46.0"
Brabham	Cooper	1 lap behind
Hill	Maserati	1 lap behind
Bonnier	Maserati	2 laps behind

# from EUROPE

mitted that GP racing requires much more finesse and fine-edge skill than does track racing, something it was good to hear come from Troy himself.

Phil Hill managed to get his first GP ride at Reims, driving one of Bonnier's two-year old cars. He drove extremely well, finishing seventh, the first private entry over the line. Now that there is an empty place in Ferrari's Formula 1 line-up, it will be interesting to see who gets it.

Speaking of the F-1 Ferrari, it went like the proverbial scalded cat both at Spa and at Reims, two extremely fast circuits. All the talk about suddenly discovered horsepower is talk and nothing else. For the first time the Dino 246 has really been wound up in top gear for long periods. It just has more steam up there than the others. Ferrari handling has improved since the rear suspension clamping points were moved closer to the center of the car, allowing more roll flexibility. The result has been the elimination of a sudden and vicious oversteer characteristic that the *Dino* demonstrated earlier. A conventional ram-type air scoop has now replaced the plexiglas hoods, vents and screens that Ferrari played with earlier in the season.

The Vanwall is now putting out as much bhp on aviation gas as it did last year on fuel. (over 270). The handling seems to satisfy all the drivers except Moss. He is bothered by a slight side-ways "twitch" that it demonstrates on certain occasions. The car does go round a corner in a completely different attitude than that of a Ferrari or Maserati. Drivers of the latter two can easily get the tail hung out in a big drift, while the Vanwall (and the BRM too, for that matter), demonstrate a complete understeer. Vanwalls were definitely down on power at Reims for no apparent reason, though some drivers tried to put the blame onto the new Dunlop R5 racing tire with its improved road adhesion!

Formula 2 enjoys international importance at Reims, for a race for the smaller displacement (1500 cc) single seaters is held just before the formula 1 event. Jean Behra's Porsche was the Barth/Frere Le Mans car fitted rather hurriedly with a central driving position. There was absolutely nothing that Collins' Ferrari could do about the Porsche. Stirling's Cooper was left way behind, too; he finally was forced to drop out when the oil pressure sagged, the Ferrari finishing second.

Jesse Alexander

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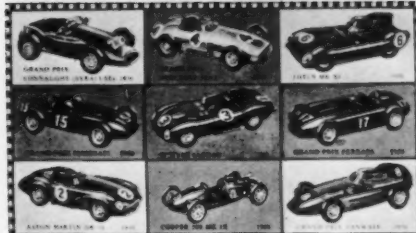


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## Marion's Meanderings

By  
Marion Weber

Hi, there! I'd like to take this opportunity to acknowledge some of the winners in a little contest we had recently and to give the correct answers . . . or rather the correct questions. This was strictly a modern contest where we gave the answers and the entrants guessed the questions. #1, which nobody got, was "Morris Garage" . . . and the correct question to this answer was, of course, "Where does Morris park his car?" #2, (which won a prize and was guessed by my husband, Charles) the answer was "Jaguar, 1951, 1953, 1955, 1956 and 1957". The question was "Name a South American animal and several years the Yankees have won the pennant". Other awards went to other members of the family. The rest of the big winners were allowed certain hard-to-get items at no increase in prices. This favoritism deserves to be extended, in the interest of good customer PR, so you, too, can take advantage of these deals:

1) RUBBER CAR MATS to protect your rugs. Here's a deal, for sure. You can order these long-wearing 14" x 20" mats with the name of your car - MG TR HEALEY JAG ALFA CORVETTE - cut right into them, and at a slightly sensational price: . . . . . \$3.25 each.

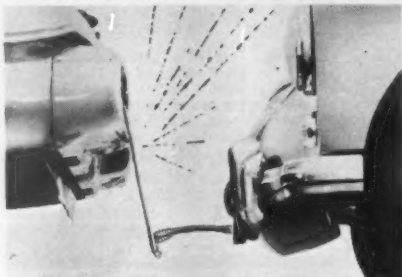
2) REPLACEMENT CARPETS . . . in case you didn't get a mat soon enough . . . We have carpets for MG, Healey, Corvette, Jag, TR & T Bird in a wide variety of colors, and a choice of wool, cut pile nylon or nylon loop, made to fit. These are ready to snap or tack in place, no sewing. Order today and sharp up the interior of your car. Specify make, year, model, material and color (black, brown, tan, red, maroon, blue, green . . . or send swatch).

Price for complete set (roadster or coupe) . . . . . \$28.50  
Driver's side only, or passenger's side only . . . . . \$10.00  
Driver's and passenger's carpet (no tunnel) . . . . . \$18.75  
Tunnel carpet . . . . . \$15.00  
Mark VII complete, front and rear . . . . . \$45.00

3) TOPS AND TONNEAU COVERS. Wet weather is icumen in, as G. Chaucer was fond of saying, and if your top is on the ragged edge, replace it now, yourself and save. We have maintained our crazy prices by sheer volume. These tops and tonneaus are tremendous quality, workmanship and fit. Easy to install and complete hardware plus full instructions are included. Here is a list of the tops available in either 3-ply de luxe fabric (with an 18-month WRITTEN GUARANTEE) or best super Vinyl (36-month WRITTEN GUARANTEE): Healey, Corvette, Hillman, Jaguar, MG, Mercedes, Morris, Porsche, TR, VW. Prices (for all cars) are like \$29.95 (3 ply) and \$43.75 (vinyl) for either small rear window or large window. You realize what a bargain this is when you know that the manufacturer's list runs from \$48.50 to \$76.00 for these same tops . . . and even more, of course when you pay someone to install it. We also have Volkswagen Sun Roofs at \$15.93 and MG Side Curtains at \$29.95. Choice of colors? Yes! White, Black (with either tan or black inside) Tan, Blue or Green. To order: specify make, year and model of car, describe body style (is it equipped with side curtains or roll up windows, etc.) state top style, quality and color. That's all it takes . . . You can also send for our catalog which gives more info on these good buys and lists more valuable accessories than you can shake a dollar at.

4) NEW GIMMICKS FOR THE TR. Here is a selection of accessories for the TR owner to treat his car to. A) stands for Ash Tray and this one replaces the inspection cap over the U-Joint . . . very nicely made in cast, polished aluminum, comes out readily for service and holds lots of butts . . . \$5.95. B) is for Bumper Guard . . . rear one. Has special wing nuts for quick on and off, but strong and sturdy . . . \$16.95. C) is for Cover, Valve, one. Shiny, finned aluminum, heavy and impressive looking. Makes the TR mill sparkle . . . \$22.95

5) It's almost winter, as we keep reminding you, so get a pair of our Grand Prix driving gloves for comfort at the wheel. Known wherever competition drivers gather, the Grand Prix remains the epitome of good taste. Natural cape. \$7.95 pr. Black Cabretta \$8.95 pr. Give size (Men's 7 1/2-10) (Gal's 6 1/2-7 1/2) and color when ordering.



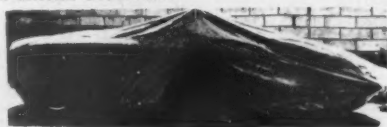
6) Regardless of the weather you'll be parking your car and when you do you are running a risk of getting front end damage which is not often covered by insurance. The SONIC SHIELD will prevent such grille bashing (unless the driver of the car ahead is deaf) because it honks your car's horn whenever the careless parker backs too close. It's a gasser to watch the expression on the faces of some of these yo-yos when they hear that horn blast! Mostly it's darned inexpensive protection . . . \$9.95. Two wires to connect, nothing else to buy.



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Ghia Gown

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\$29.50 Duralin

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## COMING EVENTS

### USAC RACES

Sept. 7 Limerock, Conn.  
Sept. 21 Marlboro, Maryland  
Sept. 28 VIR Danville, Va.  
Oct. 12 Riverside, Cal.

### REGIONAL AND NATIONAL RACES

Sept. 14 Meadowdale Raceway, Elgin, Ill.  
Sept. 14, 15 SCCA Del Mar, Calif.  
Sept. 20 SCCA Watkins Glen, N. Y.  
Sept. 20, 21 Michigan Miglia Rally, Chicago  
Sept. 20, 21 SCCA Sacramento, Calif.  
Oct. 4, 5 SCCA VIR, Danville, Va.  
Oct. 10-12 Rip Van Winkle Rally, N. Y.  
Oct. 11, 12 SCCA Vaca Valley, Cal.  
Oct. 18, 19 SCCA Lime Rock, Conn.  
Oct. 24-26 Flaming Fall Rally, Kansas City  
Nov. 1, 2 SCCA Palm Springs, Calif.  
Nov. 7-9 Appalachian Rally, Philadelphia  
Nov. 8, 9 SCCA Laguna Seca, Monterey, Cal.

### INTERNATIONAL EVENTS

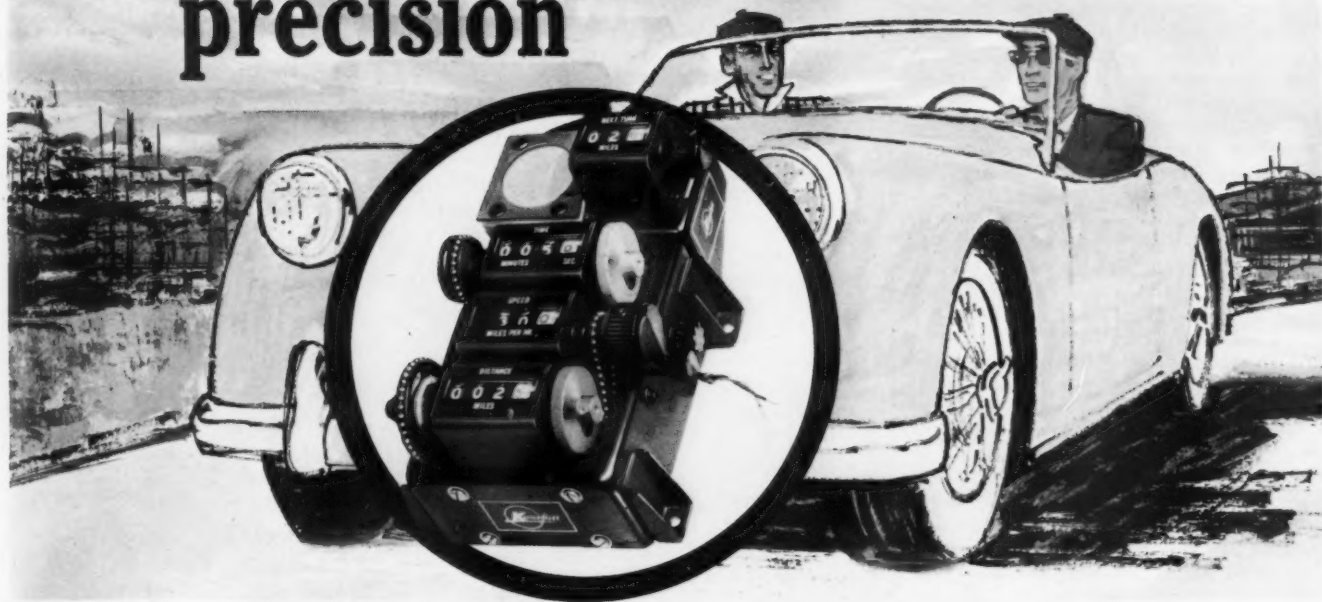
Sept. 13 RAC Tourist Trophy, England  
Sept. 19-21 Viking Rally, Norway  
Sept. 20 Oulton Park Races, England  
Sept. 21 Berlin-Avus Grand Prix, Germany  
Sept. 28 Modena Grand Prix, Italy  
Oct. 2-12 Paris Show, France  
Oct. 5 Australian Tourist Trophy  
Oct. 6 Australian Grand Prix  
Oct. 22- London Show, England  
Nov. 1 Iberian Rally, Spain  
Oct. 26 Moroccan Grand Prix  
Nov. 5-16 Turin Show, Italy  
Nov. 9 Venezuelan Grand Prix



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Torque and speed determine the horsepower developed by an engine. As a consequence there are two ways to increase the horsepower of an engine, either by increasing the torque or by increasing the speed (RPM). Supercharging increases the horsepower by increasing the torque. Engine modification (multiple carburetion, special manifolding, high compression heads, special pistons, reground cam shaft and other basic changes in engine design) increases the horsepower by increasing engine speed.

It is excessive speed or reciprocating mass that accounts for the failure of most mechanical devices. The amount of stress on engine components increases as to the square of the speed. In other words a crankshaft turning at 6,000 RPM has four times the load on it than if it were turning 3,000 RPM. Supercharging only increases the firing pressures whereas it is the inertial stresses (speed) of a reciprocating engine which is the principle cause of engine failure. Engine modification kits by increasing engine speed will increase the horsepower by 15 to 25 percent. Engine modification usually results in a rough running engine an uneven idle and a considerable sacrifice in engine economy.

Supercharging by improving the volumetric efficiency of the engine increases the torque resulting in an increase in horsepower without an increase in speed. With a conservatively supercharged pressure of only 6 psi, the average automotive engine will produce an increase in horsepower of nearly 50% with a loss in fuel economy of approximately 5%. Engine smoothness and idle are not sacrificed in any way and the improvement in performance is throughout the entire speed range of the engine if a positive displacement supercharger is used.

Engine modification requires that the engine be completely torn down and rebuilt using the components from the modification kit. With a properly designed supercharger installation however it is only necessary to bolt the parts furnished with the supercharger kit to the engine making it even unnecessary to remove the engine from the chassis. A comparison in performance and costs of the two methods clearly shows that the mildly supercharged engine will outperform the modified engine by as much as 25% and cost 1/3 as much.

The Volkswagen, VW-Ghia, MG-A, Mercedes 190 SL and Renault Dauphine are naturals for supercharging. If you own one of these cars and are interested in 40 to 50 percent more horsepower write to Judson Research & Mfg. Co., Conshohocken, Pa. for literature. A Judson Supercharger gives you more than just improved performance, it gives you a thrilling new experience in motoring pleasure. It provides amazing acceleration, surging passing ability, a higher cruising speed and a better control for safer driving.

**LIME ROCK  
JULY 5, 1958**

Bob Coogan.

What happened to the script? Seems that Ed Crawford got a bit tired of the old saw, "Always a bridesmaid..." and went a bit faster on the last lap (or was it the next to the last?) than his team-mate, with the result that Hansgen lost the chance to cinch the championship, while Alfred Momo lost a hammer. It may have been due to some confusion as to the number of the lap, but whatever the reason, Ed stormed through the final downhill right-hander like the proverbial bat, and provided a surprising change to the usual result.

**F Production**

- |                   |         |
|-------------------|---------|
| 1. E. Pupildy     | Porsche |
| 2. Maj. Cappiello | Porsche |
| 3. Sherman Decker | MGA     |

**G&H Production and H Modified**

- |                  |            |
|------------------|------------|
| 1. Ray Anderson  | Alfa Romeo |
| 2. John Clapp    | Alfa Romeo |
| 3. G.P. Fogg III | Alfa Romeo |

**E Production**

- |                 |            |
|-----------------|------------|
| 1. Harry Carter | AC Bristol |
| 2. Jordan King  | AC Bristol |
| 3. Evelyn Mull  | AC Bristol |

**D Production & G Modified**

- |                 |             |
|-----------------|-------------|
| 1. Floyd Aeskov | Lotus Mk XI |
|-----------------|-------------|

- |                  |             |
|------------------|-------------|
| 2. Len Bastrup   | Lotus Mk IX |
| 3. Charles Kurtz | Elva        |

**B & C Production**

- |                       |              |
|-----------------------|--------------|
| 1. Fred Windridge     | Corvette     |
| 2. George Arents      | Ferrari      |
| 3. George Constantine | Aston Martin |

**Formula III & Unrestricted**

- |                  |        |
|------------------|--------|
| 1. Paul Richard  | Cooper |
| 2. Harry Whitney | Cooper |
| 3. James Haynes  | Cooper |

**C, D, E, & F Modified**

- |                 |                |
|-----------------|----------------|
| 1. Ed Crawford  | Lister-Jag     |
| 2. Walt Hansgen | Lister-Jag     |
| 3. John Fitch   | Maserati 200-S |

**WILKES-BARRE  
JULY 19, 1958****Novice race: #1**

- |                     |      |
|---------------------|------|
| 1. Alfred Zantinger | Elva |
| 2. E. H. Sales      | MG-A |

**Novice race: #2**

- |                   |          |
|-------------------|----------|
| 1. Collier Miller | Alfa     |
| 2. Jim Dunavin    | TR-3     |
| 3. A. Foresyth    | Corvette |

**G & H Production Sedans**

- |                    |       |
|--------------------|-------|
| 1. Howard Hanna    | DB    |
| 2. Charles Kolb    | Volvo |
| 3. Ray Heppenstall | DB    |

**G & H Production**

- |                   |      |
|-------------------|------|
| 1. Jim Fitzgerald | Alfa |
| 2. Collier Miller | Alfa |
| 3. Steel Roberts  | DB   |

**G & H Modified**

- |                  |       |
|------------------|-------|
| 1. Bert Foster   | Elva  |
| 2. Ray Saidel    | Jomar |
| 3. Tom Scatchard | Lotus |

**Formula III**

- |                  |        |
|------------------|--------|
| 1. Harry Whitney | Cooper |
|------------------|--------|

**D & E Production**

- |              |            |
|--------------|------------|
| 1. Sam Moses | AC Bristol |
|--------------|------------|

- |                     |                   |
|---------------------|-------------------|
| 2. H. B. Williamson | Morgan            |
| 3. Bud Faust        | Austin Healey 100 |

**Triumph Race**

- |                |  |
|----------------|--|
| 1. Robert Samm |  |
| 2. Pierre Mion |  |
| 3. Don Messick |  |

**MG Race**

- |                     |  |
|---------------------|--|
| 1. Millard Ripley   |  |
| 2. George Valentine |  |
| 3. E. H. Sales      |  |

**Porsche Race**

- |                     |  |
|---------------------|--|
| 1. E. E. Hobbs, Jr. |  |
| 2. Steve Wilder     |  |
| 3. Ed Eichenlaub    |  |

**C & B Production**

- |                 |          |
|-----------------|----------|
| 1. Roger Pensky | Corvette |
| 2. Ben Moore    | Corvette |
| 3. Edwin Myers  | Corvette |

**Open Race**

- |                   |                 |
|-------------------|-----------------|
| 1. Millard Ripley | Elva MKII       |
| 2. Dick Matthews  | Corvette-Healey |
| 3. Harry Whitney  | Cooper F III    |

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Renault Dauphine Exhaust System	27.50
Alfa Giulietta Sprint Exhaust System	69.50
Alfa Giulietta Spyder Exhaust System	79.50
Vespa Exhaust System	19.95
Lambretta Exhaust System	19.95
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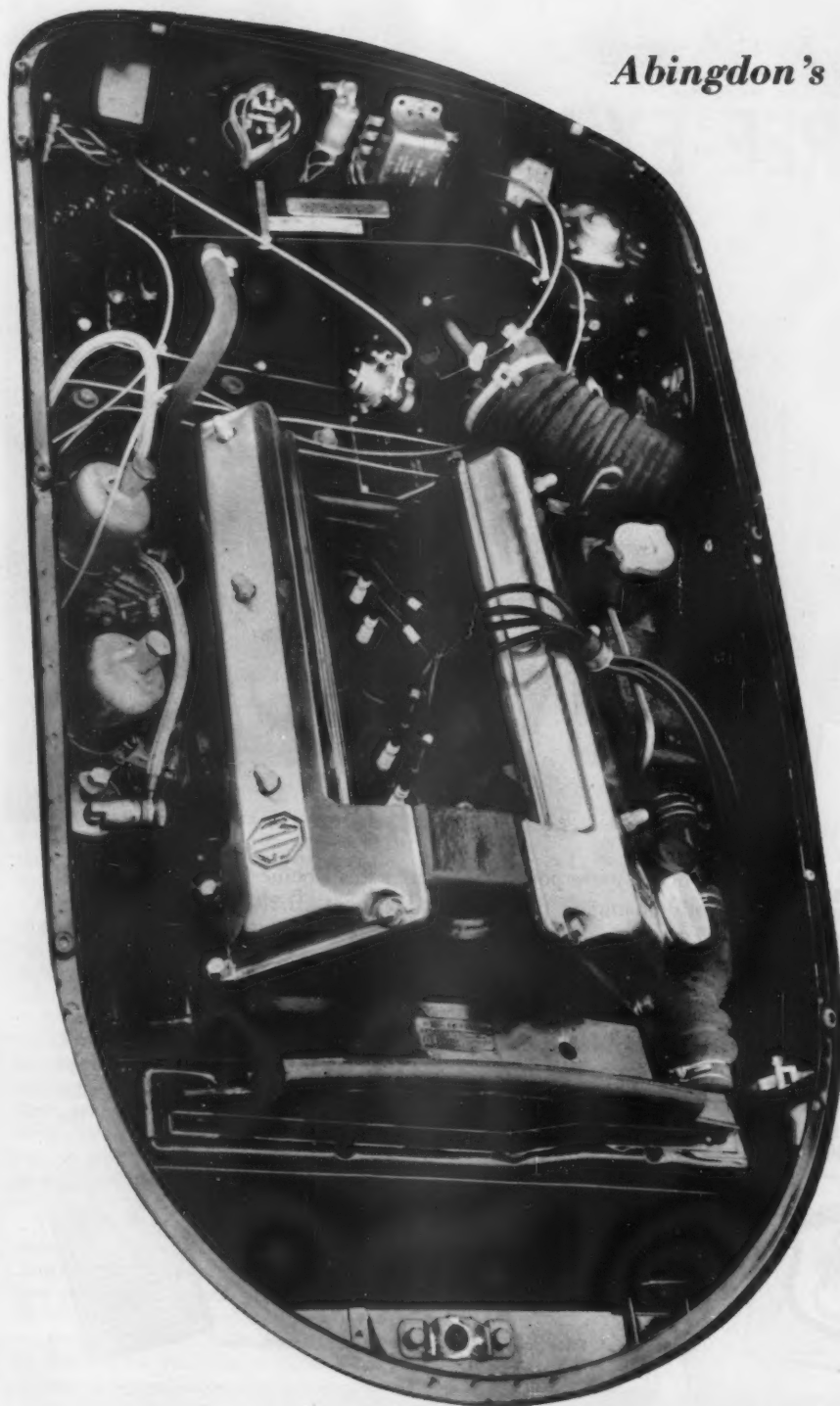
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# SCI ROAD TEST: TWIN CAM

# MGA

*Abingdon's most muscular Midget.*



*Here it is: 1588 cc and 107 hp of racing potential. Widely spaced valve covers, manifold completely fill MGA engine room.*

**F**OR THE MAN who merely takes a quick look at the products of the MG car company produced since 1936 and who has a smattering of knowledge concerning what went on at Abingdon during the halcyon days prior to that date it is easy to call the marque either stagnant or "commercial" and let things go at that.

From 1929 to 1936 the cars bearing the brown and cream octagon had made things very hard indeed for racing handicappers who had to revise their MG performance estimates upwards with boring regularity only to find that Kimber and company had with equal regularity managed to field something even hotter than before. Then came the Nuffield reorganization and the end of a formal racing and development organization as far as the men of Abingdon themselves were concerned. Help was given as before with open-handed and open-minded generosity to those who wished to race the marque but the factory crew must concern itself with production and the business of building cars for money.

Gone were the days when the production lines found themselves hard put to keep up with the stream of ideas and new designs that poured from the facile minds of H. N. Charles and his design staff. Gone were the taut sports and racing cars with their single overhead cam engines that could twist up a 7000 rpm storm and pump a gutty 120 to 140 horsepower from a miniscule 750 to 1100 cc's. No more J-4's, mighty K-3's or sizzling Q's and R-types were to roll out the doors and onto the tracks. The year 1936 was the year of the rocker-box and the beginning of the bread-and-butter sports car. It was the year of the TA.

Not, mind you, was it the end of the MG Midget. Not at all. It's just that things weren't quite the same.

Yes, to the man who just looked at the surface it was easy to say that the men of Abingdon had gone commercial, that things had changed. But to those who looked beneath the surface it was quite clear that they hadn't changed all that much. The minds in the back room were still as facile as before, the slide rules as well used.

If any proof of this was needed, one has only to look at the MGA. Merged with the mighty BMC combine, John



Thornley's men came up with a new car to fit the new production components and did it in little more than a year. All BMC products must use basic BMC parts and this standardization includes engines, gearboxes, rear ends and the like as well as minor equipment. None of this materiel bore any relation to past practice. Yet, *Voilà*, there was the MGA.

To your truly shriven MG owner all of this was horrifying. Nuffield had been heretic enough but this last merger was unspeakable. They reckoned without Messers Thornley, Enever et al. And they also did not notice or refused to see the significance of something else. In 1955 the men of Abingdon showed up at LeMans with three sleek alloy bodied cars labeled EX 182. The summer before they had arrived on the salt at Bonneville with a chunky, brick-like streamliner tagged with the designation EX 179. Both bore the BMC B-type engine which later sat between the rails of the MGA in somewhat more civilized garb. Later, something called an MGA appeared at the Ulster TT. Outwardly it was EX 182 but inside it carried an engine with the unmistakable dimensions and covers of a DOHC head. And in the summer of 1956 EX 179 appeared again on the salt with a similar piece of equipment tucked into its chunky insides. And in 1957 came EX 181, a ground missile of the most advanced type and again equipped with that portentous dual cammed engine, this time equipped with a monster 305 cubic-inch-per-revolution Shorrock blower! Output: 290 bhp. Speed? Something in hand over 240 miles an hour.

They had changed at Abingdon, had they? Not much they had! The same men, with a few exceptions, who had bolted together the last R-type, were at the same old stand doing the same old things. And with the same aims in mind — building sports racing cars at competitive prices.

And early this July the news was let out. That double-cammed head for the BMC block was to be a production item — not a conversion piece but equipping an entirely new automobile. Well, not en-

tirely new but with enough engineering changes in mounting, gearing and suspension to obviate attempts at shade tree conversion from the standard MGA, which, by the way, continues to form the bulk of the company's output.

In short, after 22 years, the reign of the rockerbox was over at Abingdon. The Marque of the Octagon was once again represented by a production racing sports car. Not that post-Nuffield MG cars have not been raced—they have been and on occasion successfully and well. But, to face facts squarely, they haven't been competitive except on rare occasions with other marques of their own class. The difference is in the point of view—the rockerboxes were street sports cars that could be raced; the early single-stick cars and the new MGA Twin Cam are racing sports cars that can be street-driven.

What hath Abingdon wrought? Basically they have turned out an improved MGA that will go, according to the gear ratios used, some 20-odd miles an hour faster and (again according to the gear ratios used) will do it considerably quicker, especially in the driving ranges of between 40 and 100 miles an hour. Having made the car go that much quicker, they also figured to stop it equally as fast and to this end they have mounted as standard Dunlop disc brakes on all four corners.

Two specific items combine to give the car its speed. First, since nothing beats cubic inches except rectangular money, the basic BMC B-type block has been punched out to a new bore size of 2.969 inches (up from 2.87) for a total displacement of 1588 cc's or 96.906 cubic inches. Then they tossed in the rectangular money with the double overhead cam head. This little item gives the engine 1500 rpm more at the top end.

The head, being the big item, is worth close study. The head itself is of aluminum alloy attached to the block by ten studs. The valves are run in at an included angle of 80 degrees and operated through shimmed cups by two chain-driven camshafts. Clearances are set by changing the shims which are supplied in a large variety

of sizes. Each camshaft runs in three renewable white-metal bearings and is driven by a  $\frac{3}{8}$  inch pitch Duplex roller chain from a half-speed shaft in the left side of the block. This half-speed shaft is driven in turn by a pair of reduction gears from the crankshaft. The tach, distributor and oil pump are also driven by this shaft. Pistons, of course, are special items with three compression rings and one oil ring and are equipped with full floating wrist pins. Compression ratio is given as 9.9 to 1. Hung off the right side of the head is a large log-type manifold bearing two big H6 S.U. carburetors and set up with mounting flanges to take an even larger size. This being an MG and the MG people being the sort of blokes they are new and better things are planned for the engine in the future, hence the big mounting flanges. Makes one wonder what a Stage Four would do considering the effect of such tuning on the pushrod version. As it is, this small bear pumps out 107 bhp at 6500 rpm.

How does this road eater go? Very well indeed, all things considered. SCI's test car was really and truly just that—a moving test bed. One of the first batch to arrive in the U.S., it was bound to have bugs and did. Not bad ones, mind you; just the bugs expected from a fresh production line item.

We picked the car up from Hambro Automotive Corporation in virtually the same shape it had been shipped. It sat in the garage looking, except for the knockoff hubs, just like any MGA. We slid into the seat and about the only immediately noticeable difference was the tach which was orange-lined at 6500 and red-lined at 7000 rpm. Yanking the starter-pull (when *will* they trade that thing off for a proper button?) started the engine into a busy 900 rpm idle and a heady aroma of Castrol "R" arose from underneath. Sliding the butter-soft gearbox into low we eased out the garage doors and into the street, treating the throttle with all the caution rated by a drag machine. It wasn't necessary—the car was as docile as any rocker-head MGA. This applied all

*Editor bends the Twin Cam MGA through tight hairpin at Lime Rock during lap-time tests. Added weight of new engine caused considerable lean but the car stuck and handled well, even with "street" tires.*



OCTOBER '58

through New York City traffic with the added benefit of being able to stay in a given gear for a longer period of time and over a considerably wider range of speed.

Cruising out into suburbia, we ranged through Third and Fourth gears according to the speed laws on various stretches, keeping the tach wavering between 2500 and 4500. The twin cam engine with its slightly larger size pulled steadily and seemingly equally over this entire range. It was when the 4500 rpm mark was passed that the new engine began to reveal its capabilities, though. If the factory's power curve can be applied to this particular car, the horsepower rating shoots up from 76 to 98 bhp in the space between 4000 and 5000 rpm. This boost can be felt immediately—where the standard pushrod engined car begins to taper off, the twin cam version is just starting to belt out its new-found power. It's not a mad, bellowing slam in the back but a smooth, deceptive rush that can get you from 40 to 70 mph in just over four seconds, using Third gear in the optional close ratio box. Depending on the gearbox used and the rear axle ratio chosen, Third gear is good for anything from 75 to 85 miles an hour, more than fast enough for

we headed off for Lime Rock with the Twin Cam in company with Andy Woods, Hambro service executive. For this trip the car was in standard trim—in fact sub-standard as facts later proved. It hadn't been touched except for the addition of oil, water and fuel since it had come off the dock. Further it showed only about 600 miles on the meter and the first few hundred of those miles had scarcely been normal break-in driving. Gearing was the standard box and the 4.3 rear axle ratio.

Buckling on crash helmet and stuffing a bag of laundry at left hip to cut side sliding, yours truly began circulating the course, slowly at first and then progressively more quickly until the comfort-discomfort threshold was reached (a somewhat lowered point than normal due to lack of seat belt). The result was six consecutive laps varying between 1:22.5 and 1:23.0. This is representative of fair-to-good time with a rocker-head MGA set up for competition. Not spectacular but indicative of much, much more potential—in other words, fresh off the boat, with nil preparation and with a driver not overly familiar with the car under competition conditions, the "TC" turned in a series of lap times that were competitive

swapped on the site.

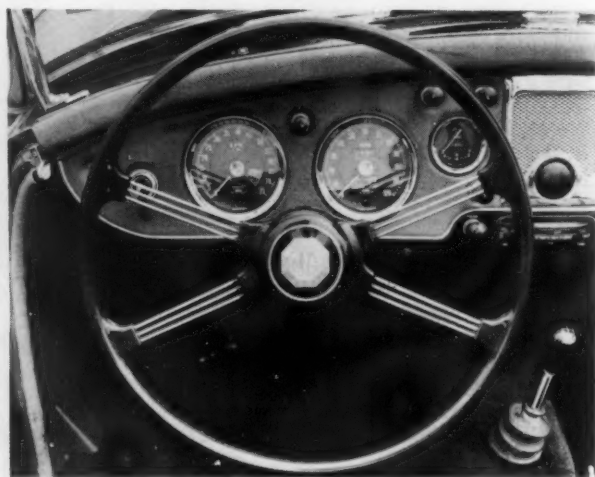
At the track the engine fired up with a noticeably sharper, biting rap, denoting valve and ignition timing that was right on the mark. Within three laps we were circulating two full seconds quicker than before and this on a course that was still damp from an early-morning rain. Not bad for a start. Then the rear end gears were swapped for the 4.5's. With the nose-cone all set up we had what was in effect a semi-quick-change rear end and the swap was completed in less than an hour.

Time was short so a lap time was taken with only one standing lap and one flying lap, the flying lap being clocked. Results: another second chopped off the time.

Still using the close ratio box we tried some more standing starts. Bear in mind that the optional box is terrific for racing once under way, but all the gear ratios have been shoved upward toward the high end. Starts with this rig in low are much like using Second gear in the standard box. The time to 30 mph was *still* four seconds flat but just about then the machine really started to charge—it took just eight more seconds to hit 70. Zero to 60 was 9.7 seconds, an improvement of almost four seconds over the time set by the car



*Externally the Twin Cam looks little different from the standard version except for the center-lock wheels.*



*Another tip-off is the tachometer, which is orange-lined at 6500, red-lined at 7000 rpm.*

highway passing and, used injudiciously, quick enough to make big black marks on a driver's license. At no point in traffic did the car buck, miss or seem to be lugging except for a slight hesitancy off the mark at traffic lights when too little engine speed was given on clutch engagement. And at no time, even in crawling rush hour crowds did the car tend to overheat as do some other highly tuned machines. In normal street trim with muffler, moderately soft plugs and normal carb needles the temperature stayed at 180° regardless of whether the car was pushed hard in gear or idled down in high.

However, what we were really interested in, as were the service department crew at Hambro, was how the car stacked up on a race course in both normal street and racing trim. Consequently one fine morning

with prepared versions of the standard MGA. Standing starts at first were another matter due to a couple of factors, one being the totally untuned engine, the other being a soft "street" type clutch that wouldn't bite until the engine had lugged down to 2000 rpm. The result was a four-second crawl to 30 mph.

Then we turned the car over to the tender administration of Ed Brown, the man who prepared last year's Austin Healey team cars for Sebring. Ed spent a day setting things to the specs as supplied by the gospel according to Abingdon, adding a straight-through pipe to the tuned exhaust system and stuffing an optional close ratio gearbox under the tunnel. Then back to Lime Rock again with an extra nose-cone for the rear end set up with 4.5 to 1 gears, this last item to be

in untuned street trim.

After these runs, we huddled with Andy, Ed and Frank Harrison, Hambro Service Manager to see what we could sift out of the mass of data. The conclusions were pretty obvious. The car as presently set up with standard gearbox, soft clutch and 4.3 to 1 rear end is ideal for cross country high speed cruising in the Continental fashion and for rallying. For serious racing the set-ups should vary depending on the area involved.

In all cases the competition clutch is almost a necessity—the Twin Cam pumps enough power on engagement to start the normal street clutch slipping after a few racing-type starts. It doesn't slip once under way but it doesn't bite quick enough to slam the car off the mark. Racing tires are a "must" for serious competi-

tion work; slightly increased weight and the fiercer thrust of the car peel down a standard road tire, even the excellent ones with which the car is equipped, in one hot practice session.

In the East, where the courses are short and tight, the car should be ordered with the 4.5 rear end and the standard gearbox to allow jackrabbit starts and quick jumps between corners. In the far West where the courses are longer, the 4.5 rear axle and the close ratio box are in order, though the standard transmission will do the job on the twistier, shorter circuits.

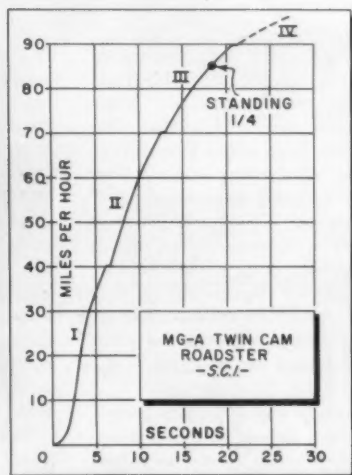
As for brakes, don't worry about them. These Dunlop discs are beyond doubt the best production sports car binders in the world, particularly when the dense competition pads are used. They're exactly the same as those used on this reporter's competition Austin-Healey Six-port and will haul that muscular machine down to cornering speed from 115 miles an hour in just a shade over 50 feet hour after hour. They'll do the same for the Twin Cam as well—probably better for that matter due to the lighter weight of the MG. In our regular 10-stop test they showed nil fade and not a fraction of an inch pedal loss. After this we went out and turned an hour's worth of fast laps. Still no fade.

From all we can tell at this point (there'll be more to come) it looks as if inter-marque competition is returning to the small-bore class. The potential in class of the new Twin Cam MGA will be limited only by the potential of the man behind the wheel and of the man who has charge of the horses under the hood.

—John Christy



Hubs depart from past practice, using pin drive on disc wheels.



## MGA TWIN CAM ROADSTER

Price at East Coast POE (Basic) . \$3345  
Price at West Coast POE . . . . . \$3345  
U.S. Importer: Hambro Automotive Corp.

### PERFORMANCE

#### TOP SPEED:

(Estimated, with 4.3 to 1 axle) 120 mph

#### ACCELERATION:

From zero to	seconds
30 mph. . . . .	4.0
40 mph. . . . .	6.1
50 mph. . . . .	8.3
60 mph. . . . .	9.7
70 mph. . . . .	12.9
Standing ¼ mile. . . . .	18.8
Speed at end of quarter. . . . .	85.0

#### SPEED RANGES IN GEARS:

(Standard gearbox)

I. . . . .	0-31
II. . . . .	10-55
III. . . . .	20-85
IV. . . . .	25-120 (est.)

#### SPEEDOMETER CORRECTION:

Indicated Speed	Timed Speed
30 . . . . .	30
40 . . . . .	40
50 . . . . .	50
60 . . . . .	60
70 . . . . .	70.5

#### FUEL CONSUMPTION:

Hard driving (racing laps) . . . 12 mpg  
Average driving (under 60 mph) . . . . . 23 mpg

#### BRAKING EFFICIENCY:

(10 successive emergency stops from 60 mph, just short of locking wheels)

Nil fade, Nil pedal loss

### SPECIFICATIONS

#### POWER UNIT:

Type . . . . .	Four-in-line, water cooled
Valve Arrangement . . . . .	Double overhead cam
Bore & Stroke . . . . .	2.97 x 3.5 in (75.4 x 88.9 mm)
Stroke/Bore Ratio . . . . .	1.2/1
Displacement . . . . .	96.996 cu in (1588 cc)
Compression Ratio . . . . .	9.9/1
Carburetion by . . . . .	Two H6 Su
Max. Power . . . . .	107 bhp @ 6500 rpm
Idle Speed . . . . .	800 rpm

#### DRIVE TRAIN:

Transmission ratios test car	optional ratio
I. . . . .	3.64 (2.45)
II. . . . .	2.21 (1.62)
III. . . . .	1.38 (1.27)
IV. . . . .	1.00 (1.00)
Final drive ratio (see text) . . . . .	4.3 (4.55, 4.88, 5.12)
Axle torque taken by . . . . .	Springs

#### CHASSIS:

Frame . . . . .	Box section
Wheelbase . . . . .	94 in
Front Suspension . . . . .	Coil Springs, IFS
	Unequal length wishbones
Rear Suspension . . . . .	Semi-Elliptic Leaf Springs
Shock absorbers . . . . .	Lever and piston
Steering type . . . . .	Rack and pinion
Steering wheel turns L to L . . . . .	2.7
Turning diam., curb to curb . . . . .	32 feet
Brakes . . . . .	Dunlop disc, 4-wheel
Tire size . . . . .	5.90 x 15

#### GENERAL:

Length . . . . .	156 in
Width . . . . .	58 in
Height . . . . .	50 in
Weight, as tested . . . . .	2200 lbs
Weight distribution, F/R as tested . . . . .	51/49
Fuel capacity . . . . .	12 U.S. gallons



OCTOBER '58

# Put-in-Bay



By Len Griffing

**P**UT-IN-BAY is a gentleman's race, and all the gentlemen are young. Fact is, of the hundred-plus drivers who entered this year, 54 were classified as novices—the official name given to all those who never raced this course before. The informality and the *esprit de sport* made one think immediately of Watkins Glen ten years ago and Bridgehampton of days gone by. And the cars of the competitors reflected the attitudes of the drivers.

With only two or three exceptions, all of the cars were driven to the ferry, (it was pathetic to watch the slushbox-oriented ferry personnel lug highly-tuned small-bore equipment up the ramp) and to the pit area under their own power. At the "pit", (an open field) spark plug changes and last minute tire gauging constituted normal pre-race attention. But then, the production cars were *production* cars, exactly as they left the showroom of the local dealer.

All of the races had one factor in common—a lot of cars didn't finish. Since almost all of the cars in any race were really stock, many drivers felt that the edge had to come from them personally. Thus, they bore into every corner like it wasn't there, knowing that they were going too fast but just hoping and praying that they'd make it anyway. Then again there was the one-mile-long straight. Spectators could watch the expressions on the faces of the MGA and Alfa drivers as they thought, "I'm five-hundred over the red-line now, but if I back off he'll take me. I'll hold it until the valves crash."

And of course there was a "biggest blow-up trophy" for the driver whose pistons crashed loudest before his valves, awarded to Charlie Stoddard who blew up his Alfa on the last lap, sputtered first across the finish line anyway, and had to substitute a little fire-extinguisher work for his victory lap.

The course itself was no cream-puff;

it was out there in the open. The best topped roads were always narrow, and many of the turns were set up to the disadvantage of reverse banking. The mile-long straight was choppy—the kind of chop that makes the rear wheels do as much steering as the front wheels; another three-quarter mile straight had two sky-line rises that made 100 mph cars airborne; the start-finish straight was fully curbed and exceedingly rough at the braking area before the turn. Several cars lost their shocks completely at this point on the first lap, and severe braking became a series of rabbit-like leaps. All but the best were "bottoming."

SCI's entry was a tired-looking but really quite potent Porsche Super that took tech inspection in stride—except for the hand brake. Steve (Wilder) explained that if he tightened it the rear wheels would lock on the course. "Tighten it anyway"—so we did.

Arriving at T. I. for the second time

an audible buzz went through the crowd. "He has no emergency brake." Steve backed the entire length of the wall, spun rubber half the length of the shop, jumped the handbrake, and slid the back wheels *right out of the doors*. Applause greeted this one.

The staff, remembering Corvette's 1957 debut, in which the styling department was brought along just to paint the numbers, could do no less. We thought along our Art Department. And along with handbrake trouble, T.I. couldn't read our numbers! Forbes fixed this with Kem-tone, which defies solvent, and to this day the police still show interest in the big yellow-and-black #50 on the side. Oh, well, the car needed paint anyway.

Our pit operation consisted of changing wheels, backing off on the hand brake (Yes, the rear wheels *did* lock up) and changing shocks (seems we were always changing shocks). We finally settled on the original pair that got the car from New York.

Driver's meeting in Town Hall spelled out the rules. An accident would probably put an end to this annual race, so safety comes first. Everyone races first for fun, to win secondly. No-passing signs are located 50 yards before each corner, and in this NP area the corner belongs to the outside car that has the line.

Question: "What happens if he doesn't give it?"

Dick Henn, who officiated: "If you're racing here, you're assumed to be a gentleman!"

But these gentlemen really did put on a race. Everyone who put rubber to road was out to win, and though the rules were perfectly adhered to (not one car was black-flagged) clusters charged down every straight and somehow—though I don't know how—managed to single out either through the corner or down the escape road. The only accident was in practice, when a 4-CV Renault rolled on a turn, was righted, and continued to circulate. However, after the day's racing all but a handful of the haybales fell casualty.

The first race was a nostalgic contest between TC's, TD's and TF's that finished

one each in that order, settling no arguments. The next race was a walk-away for the Elva driven by Chuck Dietrich, who's been a regular at Put-In since its inception, although the Berkeley team, and Lone Isetta and SAAB entries provided more interest. The Alfa race was the hairiest of the day. The two leaders, Stoddard (best blow-up trophy) and Trofimov, were way ahead, as they cornered and shifted smoothly throughout. The continuous over-extension of the mad pack that followed had everyone but themselves waiting for the crunch of metal.

We had a personal interest in Race Four—Porsche #50. The local papers said it was a closely contested race, but Ed Eichenslaub's Carrera passed Steve on the first lap at the second turn, and Steve actually didn't see him again until the Wilkes-Barre Hill Climb!

The last race was a close finisher, but Holder's Spyder edged out Baughman, and McBryde's Arnolt-Bristol showed the Triumphs the quick way home. And after the race there were the awards.

Since we had a Super running against

13 MGA's, we (SCI) offered a trophy for the fastest one. Deciding to give something *now*, instead of something better later, we bestowed on Bud Pell, with apologies to cartoonist Lichty, a large, white shop coat emblazoned front and rear "Hero-type Driver". It was worth parting with the jacket to watch the grin on his face!

The crowd had complete freedom to watch the race from any vantage point they wished, and though none of the cars were running on alcohol many of the spectators were. One in particular, who wanted to get a free ferry ride to the mainland, hobbled across the track about 150 feet from a fast bend. Since his right leg was in a cast and he needed crutches, we just assumed he'd tried the same thing at a previous meet. If he had misjudged, a nudge from one of the speeding machines would have sent him to the mainland without an assist from the ferry; that is, if he didn't just plain orbit. But once the police decided to control the crowd, they acted with finesse akin to the blade of a guillotine. Within a flash, one spectator who wouldn't move was escorted away.

(Continued on page 46)



OCTOBER '58

SCI ROAD TEST:



# SUPER 1600 PORSCHE HARDTOP



*The Porsche Hardtop, an open and shut case.*

**H**AVING PUT A NEW 1600 "normal" Porsche coupe through its paces in May, SCI thought it might be a good idea to put some test miles on the latest Super, not only to assess the improved performance but also to draw some additional comparisons between this and earlier Supers.

Accordingly, we prevailed upon Hushke von Hanstein to turn loose one of the factory's own test cars. The car he lent us was a striking two-tone Hardtop, Porsche's latest body option, fitted with the new 1600S engine.

To the Porsche purist, the new hardtop may not digest well but it does have advantages. First of all, as soon as you and your neighborhood mechanic have mastered the intricacies of removing and fitting the detachable lid, you definitely have two cars in one. Rearward vision is better than in the coupe and in a solid color, the Hardtop is a real beauty. Based on the Cabriolet rather than the Speedster, the Hardtop may be ordered with the padded soft top as well. Ferry





Going or coming, on concrete or dirt, the Porsche is stable yet nimble and always a delight to drive. One of the reasons is, perhaps, the well laid out cockpit. But oh, that map light! It shines right in your eyes.

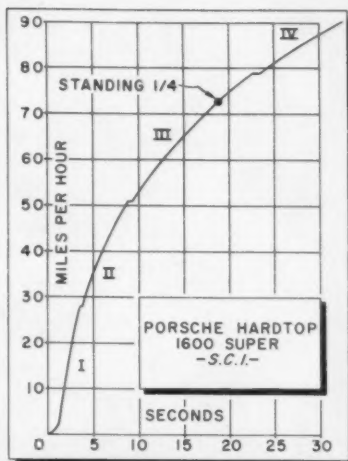
Porsche drives such a Hardtop himself these days. If you have space in the garage to hang up the metal top, well, what more could you want?

Ventilation in the Hardtop is improved by two wind wings — optional on coupes and cabriolets but standard here. However, they are not as solid as they might be, just asking to be pried open by enterprising thieves. When cracked open to allow the heater-ventilation system to operate efficiently, the wind noise is considerably louder than with the regular coupe's trailing quarter windows. On the Hardtop, the latter are fixed shut; they lift off with the top.

Those are the major differences between the coupe and the hardtop; now let's have a look at the car's performance. You've probably already scanned the performance table and said to yourself, "I thought Porsche Supers did an honest 110 mph!"

We thought so too until we had completed our top speed runs on the Munich-Ingolstadt autobahn. We came up with

(Continued on page 54)



#### PORSCHE 1600S SUPER "HARDTOP"

Price at East Coast POE .....\$4280.  
Price at West Coast POE .....about \$4400.  
U.S. Importer: .....Hoffman-Porsche Car Corp.  
443 Park Ave.  
New York 22, N.Y.

#### PERFORMANCE

##### TOP SPEED:

Two-way average .....105 mph  
Fastest one-way run .....107 mph

##### ACCELERATION:

From zero to	Seconds
30 mph	4.1
40 mph	6.0
50 mph	8.6
60 mph	12.7
70 mph	17.3
80 mph	24.3
90 mph	32.3
Standing 1/4 mile	18.8
Speed at end of quarter	73 mph

##### SPEED RANGES IN GEARS: (3000-3500 rpm)

I	15-28
II	28-51
III	43-79
IV	60-top

##### SPEEDOMETER CORRECTION:

Indicated Speed	Timed Speed
30	27
40	37
50	47
60	57
70	67
80	77

##### FUEL CONSUMPTION:

at 100 mph .....23.8 mpg  
at 60 mph .....40.6 mpg

##### BRAKING EFFICIENCY

(10 successive emergency stops from 60 mph, just short of locking wheels)

1st stop	63
2nd	63
3rd	63
4th	67
5th	60
6th	56
7th	63
8th	63
9th	63
10th	61

#### SPECIFICATIONS

##### POWER UNIT:

Type	Air-cooled, flat four
Valve Operation	Pushrod ohv, inclined exhausts
Bore & Stroke	3.25 x 2.91 in (82.5 x 74 mm)
Stroke/Bore Ratio	0.90/1
Displacement	96 1/2 cu in (1582cc)
Compression Ratio	8.5/1
Carburetion by	Two Zenith 32 NDIX twin chokes
Max. Power	75 DIN PS (88 SAE bhp) @ 5000 rpm
Max. Torque	86 lbs-ft @ 3700 rpm (DIN)
Idle Speed	6-800 rpm

##### DRIVE TRAIN:

Transmission ratios	test car	(relative to IV)	optional ratios
I	3.18	(3.90)	(309-std.)
II	1.76	(2.16)	(1.94)
III	1.13	(1.39)	(1.23, 1.47)
IV	0.915	(1.00)	(0.885, 0.96, 1.13)
Final drive ratio	4.43		(5.17)

Axle torque taken by .....gearbox case

##### CHASSIS:

Frame	Pressed steel panels welded into box sections, integral with body panels
Wheelbase	83 in
Tread, front and rear	51/49 in
Front Suspension	Trailing arms, laminated torsion bars, anti-roll bar.
Rear Suspension	Swing axles, flexible trailing arm, adjustable torsion bars.
Shock absorbers	Telescopic
Steering type	2F made, Ross-type worm and roller, steering damper.
Steering wheel turns L to L	2.7
Turning diameter, curb to curb	36 ft
Brakes	2LS front, 1LS rear, finned aluminum drums
Brake lining area	124 sq in
Tire size	"155 x 15" or 5.60 x 15
Rim size	4.5J x 15

##### GENERAL

Length	156 in
Width	66 in
Height	51 1/2 in
Weight, as tested	2310 lbs
Weight distribution, F/R as tested	43/57
Fuel capacity	13.7 U.S. Gallons

##### RATING FACTORS (SAE):

Specific Power Output	0.91 bhp/cu in
Power to Weight Ratio	26.3 lbs/hp
Piston speed @ 60 mph	1455 ft/min
Braking Area	103 sq in/ton
Speed @ 1000 rpm in top gear	28.6 mph

# LE MANS 1958

by Jesse Alexander  
and Karl Ludvigsen  
**The Races**

**E**XCEPT FOR THE FIRST HOURS and for a brief time on Sunday, it was a typically wet and soggy Le Mans, the rain coming in sudden vicious cloudbursts, completely inundating the track in certain areas. At one time vision was so restricted that the big cars reduced speed almost 50 percent, drivers peering over the windscreens straining to catch sight of slower cars out in front.

Coming up behind small displacement machinery on the Mulsanne straight in a charging 3 liter under such conditions, provided drivers with exciting moments, for the small cars would be completely obscured by blinding sheets of spray. All the driver of a Ferrari could see in front of him would be a cloud of white billowing vapor, making it very difficult to overtake a group of small cars, even in daylight; what it was like at night beggars the imagination.

So much for the weather. The race itself evolved into a duel between the Hamilton/Bueb Jaguar and the Hill/Gendebien 3 liter Testa Rossa Ferrari after six hours of the race had elapsed. By then not only had the two Scottish Jags gone out with piston trouble, but Stirling Moss, having led for a bit more than two hours was forced to retire at Mulsanne with engine failure of unknown cause. He had certainly not over-revved the Aston during his two hour stint, (keeping the revs at 6000) he had merely gotten through the corners much faster than the rest, as well as doing some superb "traffic driving". Lewis-Evans was at the wheel of the second DBR1 when he spun at Dunlop in an avoiding action, clouting the bank sufficiently hard to damage the front end. This forced him to retire. The third Aston, Brooks/Trintignant driving, dropped out at 6 a.m. Sunday morning with transmission failure.

Bent machinery and wreckage littered the side of the road for the entire eight-mile distance. Under Dunlop bridge lay Chamberlain's Lotus; close by was Picard's Ferrari, farther on up the hill before the rush down into the esses lay "Mary's" Jaguar and on the opposite side was the Gurney/Kessler Ferrari. Sadly, "Mary" (a pseudo-name for a Belgian driver) lost his life in the accident which occurred at night in the heaviest of the downpours when vision was down to practically nil.

The Hill/Gendebien Ferrari led after the third hour till 4 p.m. the following afternoon, except for a short period at

(Continued on page 51)

## The Cars

**S**PEAKING TECHNICALLY, this year's Le Mans was outstanding—outstanding in that there were very few notable new designs. Understandably, manufacturers and owners tended to fall back on machinery that had already proved itself capable of enduring the 24 Hours, though thanks to a multiplicity of prangs this foresight was not reflected in the proportion of finishers to starters.

The most successful first effort was without question the AC Prototype. There was no doubt about the ability of its Bristol engine and gearbox to last the race, but its chassis and bodywork were new to AC and thus worth testing. Le Mans not being very hard on chassis components, this aspect is inconclusive, but the AC's shallow space frame looks very light indeed in relation to its apparent strength. As before, John Tojiero and his shop had a great deal to do with design and construction of the prototype, the front suspension (parallel wishbones and coils) and frame, as well as the upward tilt of the tail being obviously related to his Climax-powered Le Mans car. AC's interest lay mainly in the new angled-axis (about 20 degrees to the longitudinal axis) and low-pivot swing-axle rear suspension. Also, with long coil springs, this arrangement is light and neat and well worth following up. Handsome in light green and somewhat after the style of the second-series Lister-Bristols, the new AC's bodywork was tested adequately by this year's rains.

Since Le Mans is not a chassis test and since we already know the Triumph engine will run fast for 24 hours, there isn't much to be learned from the sixteenth-place finish of the new Peerless. The two works cars (one didn't start) were equipped with oil coolers below the main radiator, these not being standard equipment. The cars were also bedecked with racing-style equipment like big back-window filler caps and plexiglas vents which provided hairy though rough appearance in contrast to modest performance by Le Mans two-liter standards. Cornering with the de Dion rear end appeared flat and steady, and though Jopp and Crabb were naturally going easy to ensure a finish, the fact that the Peerless stayed on the road during the rain sets it apart from some other marques in this respect.

(Continued on page 50)

Gendebien takes his turn at the works-entered Ferrari, at Mulsanne curve.



*Living on borrowed design time, one D-type was a threat to the Ferrari; Bueb, in # 8 lasted for about three-quarters of the race before retiring. Touted from Class E to Class H, and for the Index as well, a Lotus took last. Hill, Gendebien and Ferrari proved to be a perfectly matched trio, as both drivers respected the limits of the car,*



*Olivier Gendebien and Phil Hill at 4:15, after the finish, reflect joy and fatigue.*





# super spider

**"O**F COURSE it's a road machine. Alfas have a long racing history, true, but the factory also has to sell cars, and to do this we have to give customers a decent ride and enough power at the bottom end so they can handle traffic", said Karl Grassow, Service Director of Hoffman Motors. Later, Lou Comito (Huntington Imported Cars), owner and usual driver of our test car, added, "Karl is right. The car is a production car and is designed as a road car. This particular one was set up for go; but with a few simple detuning devices we use it in close traffic, too. And you wouldn't want a better machine to take to the corner drug store or around Lime Rock!" This about sums up our impressions of the Super Spider.

The term Super Spider is the terminology preferred by the factory. Actually, the SS is the newest, and by far the hottest, in the Veloce series. But let's take a look at Alfa offerings one at a time.

The production Giulietta Sprint engine is fitted with a single Solex two-stage carburetor, which with an 8.0 compression ratio produces 70 hp @ 6000, as it appears in the least expensive Spider. The other increment is the Veloce or Super engine with dual Webers and 9.1 CR producing 103 hp @ 6000 rpm, SAE (identical with the previously publicised 90 Italian). Our Alfa began to red line at 6700, which according to the factory is the absolute safe maximum; however Lou Comito said that for unsustained operation we could go as high as 7200 rpm.

Coming down the chute at Lime Rock and accelerating into the straight, it occurred to us that 1300 cc unblown shouldn't go this fast, and certainly shouldn't accelerate so savagely. The Alfa Super Spider is by far the fastest 1300 the writer has driven, one of the sweetest handling, and the car in which he felt the most confident at high speed on the twisty Lime Rock bends. After a few careful laps, one pounds up to the corners and literally throws the car at them. The car will forgive you if you overextend; the "line" is not nearly so important as it is with less tolerant cars. To the onlooker, the car may appear dreadfully out of shape because of its heavy lean, but the driver is undisturbed by it and always feels that the car is completely the slave to his slightest whim, which it is.

Once, roaring down the straight at one-hundred-plus, the writer "chickened-out", taking the escape road. The next time around, the approach was not much better, but a stab at the brake and a hard turn of the wheel threw the tail out to put the car into a perfect attitude for the sweeping right hander. Where it tightens up at the end, a dive into the apex gives the impression of extreme velocity, but an educated toe at work on the accelerator and hands that move quickly over but short distances on the wheel will seem to get one around any turn every time. As we said before, the lean, though appreciable, is imperceptible to the driver.

Lean, or body roll, has a bad reputation that it doesn't deserve. It is the result of phenomena that have certain very

*Diving into apex at speed, Super Spider leans heavily but doesn't worry the driver. Tail eases out gradually.*



Photos by Don Typond





*Graceful, elegant Farina body, the ideal compromise, blending road comfort, pride with racing functionality.*



*Engine is tilted a few degrees to make room for dual Webers. Collection box is fed through tubing over engine. Instrumented interior has quality tone about it.*



important advantages — among which is a gradualness in change of attitude. The Alfa rolls under really hard cornering, loading up the outside tires heavily. At the same time, the tail slides out gently, breaking the rear away so gradually that there is ample time to apply throttle and make steering corrections. In other words, you don't have to be a great driver to "press on" through a corner.

Now, let's take a look at the suspension that contributes to this excellent roadability. The front *ifs* is comprised of a lower wishbone with a single ball-jointed upper control arm. The bottom of the soft coil spring is based on the A-frame, the spring running diagonally upward and inward into a frame member. A tubular-type double-acting shock absorber is anchored inside the coils. Upward wheel travel is limited by the conventional rubber bumper; downward travel by a flexible cable anchored between the frame and the lower wishbone. Each front wheel is fitted with a monstrous aluminum-bonded diagonally-finned brake drum that almost completely fills the recess inside the wheel, which is vented to allow the passage of cooling air.

The rigid rear axle is anchored by two coil springs with concentric tubular double-acting shocks inside. Under extreme loading, the axle will bottom out against rubber bumpers, and two flexible metal straps limit the rebound. The axle is located by a radius rod on each side that attaches to a bracket on the underside of the axle, and anchors to the chassis at a forward point. For sideways location, there is a welded-tube triangular-shaped bracket located above the axle immediately to the left of the differential. This fastens to the frame at two points; the third point terminates at a ball joint attached to the axle housing. At either end of the axle, and nestling inside each vented wheel, is a large drum, slightly smaller than the front and vertically finned for cooling.

As may be expected from a car designed for competition, the brakes are impeccable. The writer made at least a dozen fast laps at Lime Rock, really boring into the corners before standing on the brake, often at 100 mph speeds, and there was never any indication that the brakes were being over-worked. Fade was nil, and there was always the same constant high-deceleration with very little pressure on the pedal. The car is made to stop at whatever speed the engine will drive it.

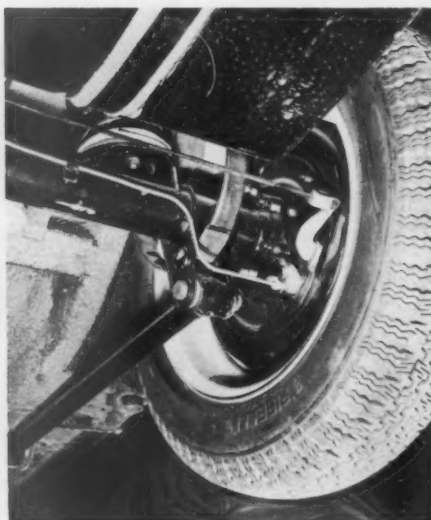
Thirteen hundred cubic centimeters is not the displacement of a big engine. By American standards, it's about equal to the volume of *two cylinders* of a modern vee-eight; even by European standards the engine is on the small side



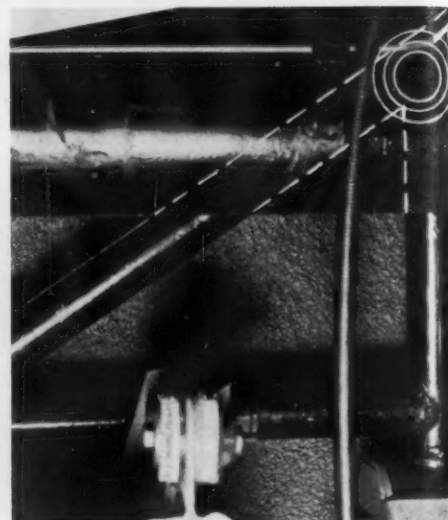
*Most of the loading transfers to the outside tires, insuring lots of bite.*



*Left to right: Alfin drum, upper control arm, spring-shock, lower A-frame with flex rebound arrester, exhaust headers.*



*Rear live axle is suspended by soft coil springs, located by sturdy radius rods. Pirelli "Cinturato" tires are standard.*



*Side location of rear axle is controlled by triangular bracket that attaches to frame, ball jointed at axle (drawn).*

## **Alfa Romeo Super Spider** *Continued*

of average. How, then, can it develop 103 hp and move a full-sized sports car through violent acceleration to better than 100 mph speeds? Well, let's take a look at the engine.

The engine is an in-line four that is just about square, with an edge of a single millimeter going toward the stroke. Compression ratio is 9.1 to 1; but perhaps the 1.28 hp/cu. in. output is possible because of the double overhead chain-driven camshafts that give the engine what seems like unlimited rpm. Revs in any gear are limited only by the amount that the driver is willing to overrev. Stroke is approximately three inches; therefore the piston speed in ft/min numerically approximates one half the rpm.

In the carburetion department, two dual-throat Webers sit on the right side of the engine, which is slightly angled to the left of the vertical to make room for the Webers. These carbs are attached by a small manifold that acts, in effect, as a spacer, and the carbs follow the tilt of the engine.

The jets in our test car were a bit too big; the engine would flood and choke up under 3000 revs, and on any sharp left hand turn. To accelerate cleanly out of the only left

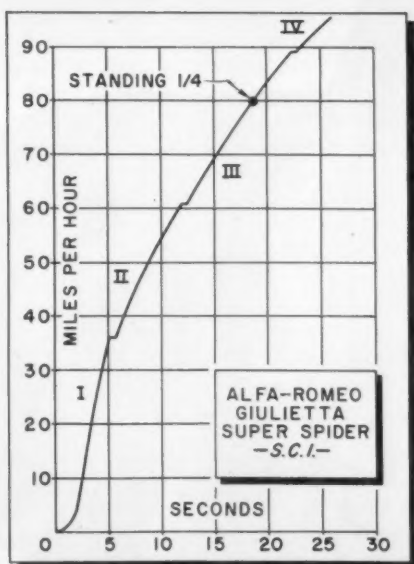
hander at Lime Rock, it was better to use 2nd gear so that the engine would clear as quickly as possible. Lou has since found the correct combination.

Fresh cool air is ducted from a scoop on the left through flex tubing into a large filter mounted atop the rear of the engine. Another flex tube feeds from the filter into a collection box closed over the air openings of the carbs, supplying cold air.

Exhaust is ducted from the bottom side of the tilted engine through headers that form into a four-into-two, two-into-one that leads into a small expansion chamber. Normally, another large chamber is located amidship, and there is a still smaller one immediately before the end of the pipe. It is a very efficient way to eliminate high back pressure at high revs without shattering the ear drums of the people in the cockpit. However, Lou's car is "SCCA-stock" which means straight pipes all the way. With the racket-buster off, the exhaust took on a beautiful hammering note up around 6000.

The driver sits in a spacious bucket seat with the shifting lever at the spot where his right hand would fall naturally





Huge diagonally-finned Alfin front drum almost completely fills inside wheel. Wheel dished, liberally vented, for air flow.



(The transmission is synchronized in all four forward gears). The instruments are hooded to prevent reflection on the windshield, and are contained within three circular faces. To the left are the small instruments — amps, heat, generator and fuel; center gauge is the tachometer; to the right the speedometer-odometer combination. Seats are fully adjustable fore and aft, and the windows are of the roll-up variety. Even though the car goes, it doesn't do so at the expense of road comfort.

The car is not without fault; no machine is. The one thing that impressed us is that this particular model is downright unhappy creeping through traffic unless it is detuned. The cam, carburetors, and clutch much prefer to be given their head. But to say that we liked the Super Spider is not enough; it is a truly marvelous machine. It has enough power on tap to sustain a drift: handling is superlative; predictable and forgiving. The interior has a quality tone about it, and the body, designed and built by Farina, has not sacrificed graceful elegance to the expediency of competition styling. It is unquestionably worth the moderate (\$3685 POE N. Y.) asking price.

Len Griffing

## ALFA ROMEO GIULIETTA "SUPER SPIDER"

Price ..... \$3686  
U.S. Importer ..... Hoffman  
443 Park Ave., New York 22, N.Y.  
9130 Wilshire Blvd., Beverly Hills,  
Calif.

### PERFORMANCE

#### ACCELERATION:

From zero to	Seconds
30 mph	4.4
40 mph	6.5
50 mph	8.8
60 mph	11.7
70 mph	15.4
80 mph	18.8
90 mph	23.3
Standing 1/4 mile	18.8
Speed at end of quarter	80 mph

#### SPEED RANGES IN GEARS: (2000-6800 rpm)

I	11-36 mph
II	18-61 mph
III	26-89 mph
IV	35-top

#### SPEEDOMETER CORRECTION:

Indicated Speed	Timed Speed
30	25
40	35
50	43
60	52
70	63
80	73

### SPECIFICATIONS

#### POWER UNIT:

Giulietta	In-line four cylinder, water-cooled
Valve Operation	Double overhead cams, vee-inclined valves
Bore & Stroke	2.91 x 2.95 in (74 x 75 mm)
Stroke/Bore Ratio	1.01/1
Displacement	79 cu in (1290cc)
Compression Ratio	9.1/1
Carburetion by	Two Weber 40DC03 twin choke side-drafts
Max Power	103 bhp (SAE) @ 6000 rpm (90 net bhp)
Idle Speed	1200 rpm

#### DRIVE TRAIN:

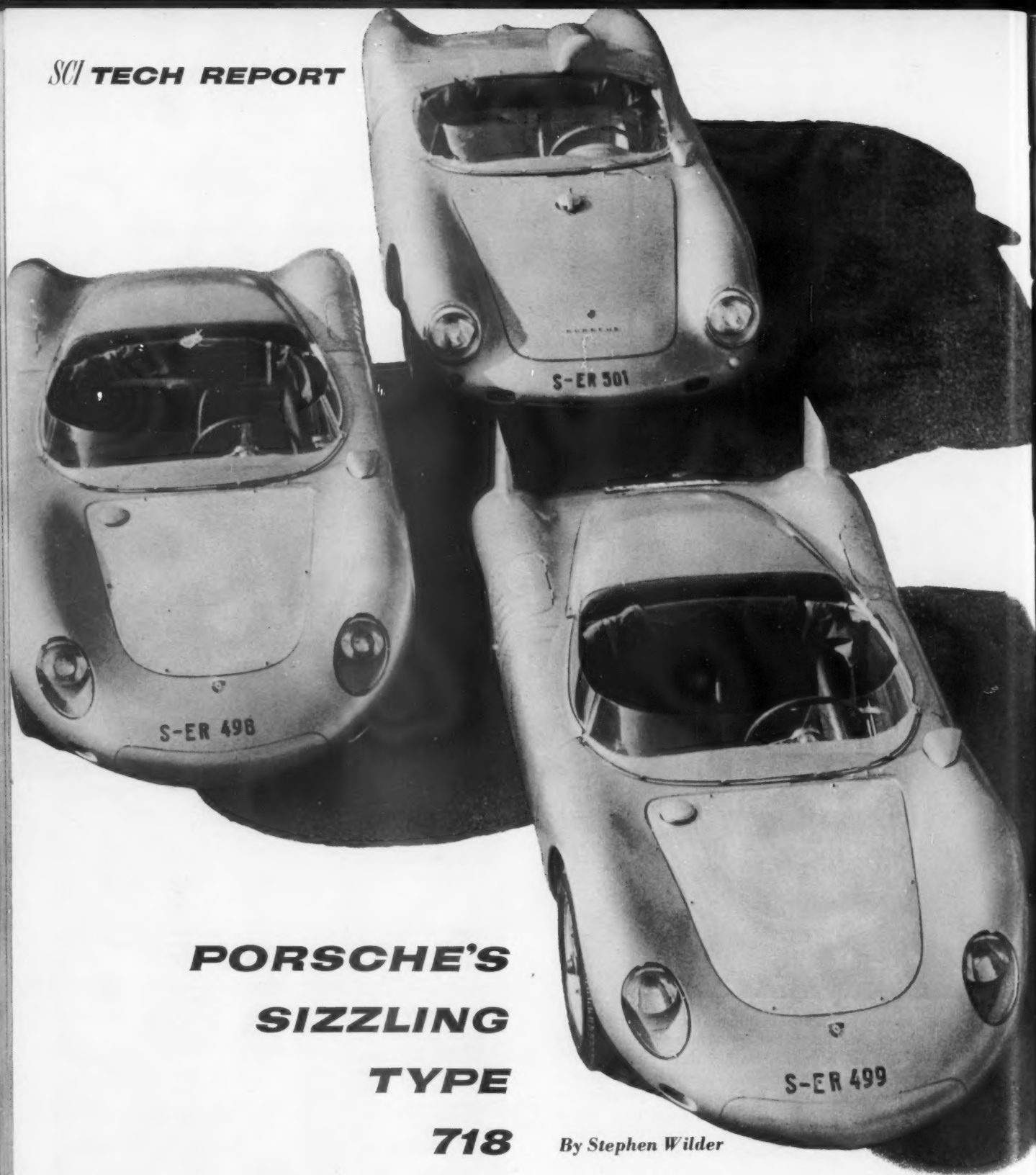
Transmission ratios	
I	3.31
II	1.96
III	1.35
IV	1.00
Final drive ratio	4.10 (4.55 optional)
Axle torque taken by	Radius rods upper A-frame
Platform frame	Welded to body panels
Wheelbase	86 1/2 in
Tread, front and rear	59 in
Front suspension	Coils, lower wishbone, single upper arm, anti-roll bar
Rear suspension	Rigid axle, coil springs, lower radius rods, upper A-bracket
Shock absorbers	Girling telescopic
Steering type	ZF worm end roller
Steering wheel turns L to L	3
Turning diameter, curb to curb	33 ft
Brakes	Finned, bi-metallic drums, 21.8 front
Brake lining area	139.5 sq in
Tire size (metric)	155 x 380 (equiv. to 5.60 x 15)

#### GENERAL:

Length	134 in
Width	61 in
Height	51 in
Fuel capacity	14 U.S. gallons

#### RATING FACTORS:

Specific Power Output (SAE)	1.34 bhp/cu in
Piston speed @ 60 mph	1765 ft/min
Speed @ 1000 rpm in top gear	17.7 mph



## **PORSCHE'S SIZZLING TYPE 718**

*By Stephen Wilder*

**“N**OW LOOK, how can a half-size sports car be running second in the World's Championship? Why, it's nothing but an overgrown VW Special.” Such remarks might get any bench racing session off to a good start, so let's look into it.

Obvious as its lineage is, the latest Type 718 Spyder is too highly developed by far to be referred to so casually in anything but jest. As to the question, well, part of the answer is Good Drivers, but it still takes good cars to get the good drivers. Another, to be sure, is that points earned by a car through stubborn reliability are just as good as those won by dazzling performance.

Analyzing the Spyder inevitably involves one in its design history. A couple of worthwhile engineering truths are strongly pointed up, too. For a basically novel concept to triumph against more conventional opponents, details and components of equal novelty must be worked out — successfully. The other is that compromises are as unavoidable in auto design as elsewhere.

Even the first Porsche is part of the Spyder's history. Back in 1948, its hopped-up Volkswagen engine was located in front of the gearbox, which moved the center of gravity forward at the expense of accessibility and usable space. Except for its tubular frame and light alloy body, the rest

was all Volkswagen, suspension, brakes, wheels and so forth.

Thus, from the very beginning, Porsches have all been linked to the basic VW layout; rear engine and gearbox, suspension at the front by trailing arms and transverse torsion bars and at the rear by swing axles.

Let's analyze this a bit. When the engine lies between wheels that don't steer, its width is no longer so important. There goes the big objection to the flat or opposed engine layout. As well, a much lower center of gravity is obtained. Incidentally, the Germans call them "boxer" engines as the plan view of the pistons in motion recalls the fists of sparring partners busily swapping punches.

With the gearbox bolted directly to the engine, it is more compact to have the rear axles in between the two. The final drive gears and the differential may then be installed in the same gearbox casing for lightness. The gearbox proper *must* be all-indirect with the torque path turning through 180°. One advantage is that any gear ratio may be altered individually. Disadvantages are that it is not easy to fit any sort of quick-change device and, though less significant, power losses will be suffered in all speeds, even top. But as a bonus, it's actually hard to avoid independent rear suspension with this arrangement. Swing axles are one of the simplest means of achieving it and their recent development leaves little to be desired in stability and control.

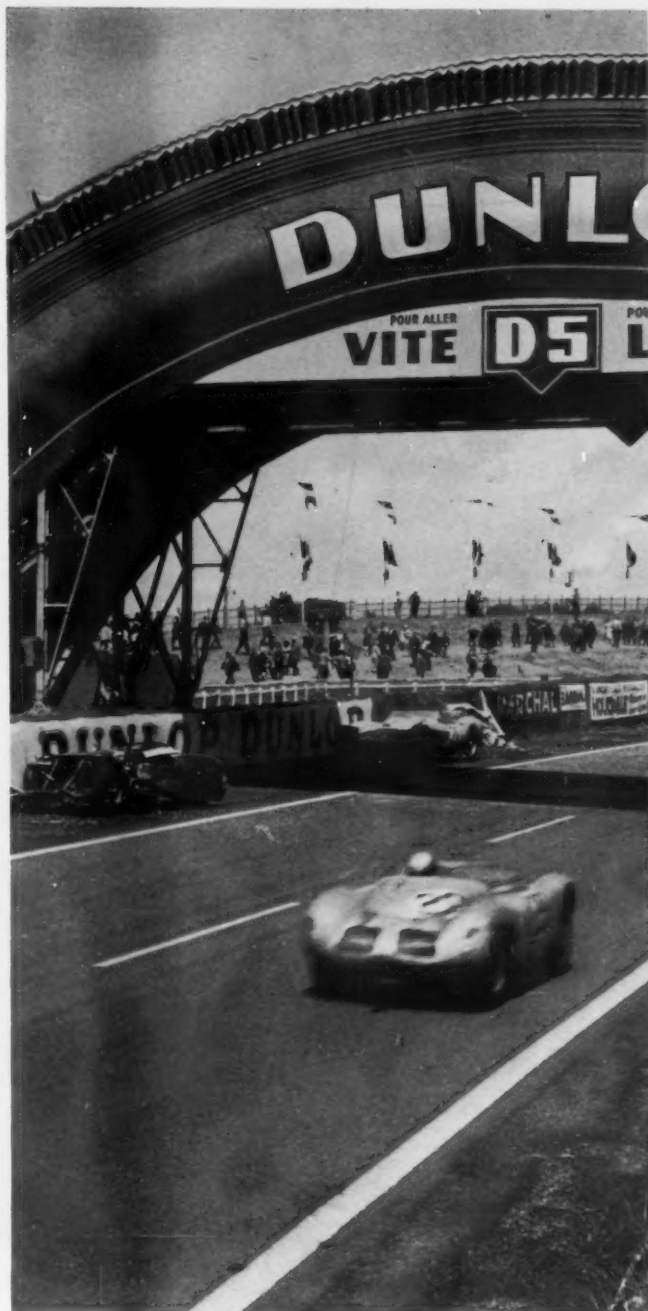
At the front, complete freedom of space allows the use of transverse torsion bars with paired trailing arms, but once these are chosen, a wide frame is called for. This is all right, since sports cars are quite wide at the cockpit and anyway, the flat four engine at the back is pretty wide itself. With such a wide frame, there's not much point in building a GP car unless you're going to go fast enough to need a streamlined body. This, to get a bit ahead of ourselves, is just where they were at Rheims this year. (First in the Formula 2 race.)

Now, given this very unusual layout with its myriad of novelties; once begun, it would have been impossible to turn the car towards a more normal configuration even if they'd wanted to. Not to be discounted with this firm or any other is that though the Racing Department races for the sheer love of it, Sales encourages them (when they're successful) for the advertising value to be had. The Engineering Department pitches in partly for the technical exercise but mainly for the useful lessons to be learned. Useful on the production line, that is.

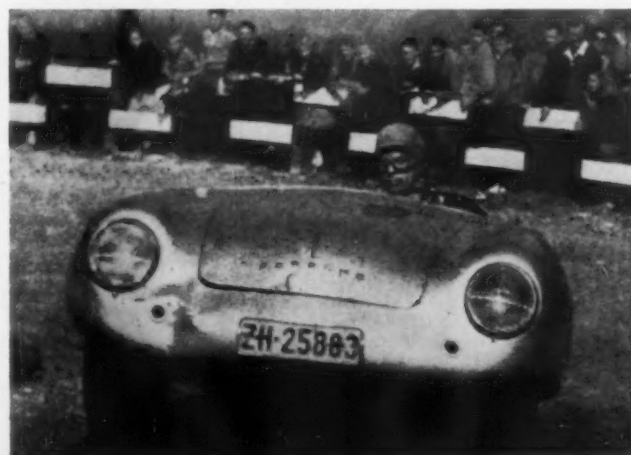
One might venture to say that with all this VW background, "The breed improves racing", but the more normal statement is true too, as Porsche's road cars are continually showing up with some new device which cut its teeth on the Spyder.

Especially praiseworthy is that so much has been accomplished by Porsche despite their starting off on a completely different tack. It's not that they've found a new miraculous way to build cars better than everyone else's, for the Spyder does have its limitations. For one thing, the biggest they've ever run the engine is 1587½ cc and this is a long way from the FIA's limit of 3000 for Appendix C Sports Cars. And it takes a heap of rectangular Deutschmarks to beat that many centimeters. If they should feel it necessary to build such a big engine (big? — the size of a Studebaker six?), the large increase in weight would make them pause before they'd pop it into the rear of a stretched out Spyder. When you change one item so drastically in a well rounded package, you will have to change a lot of others if the package is to stay round.

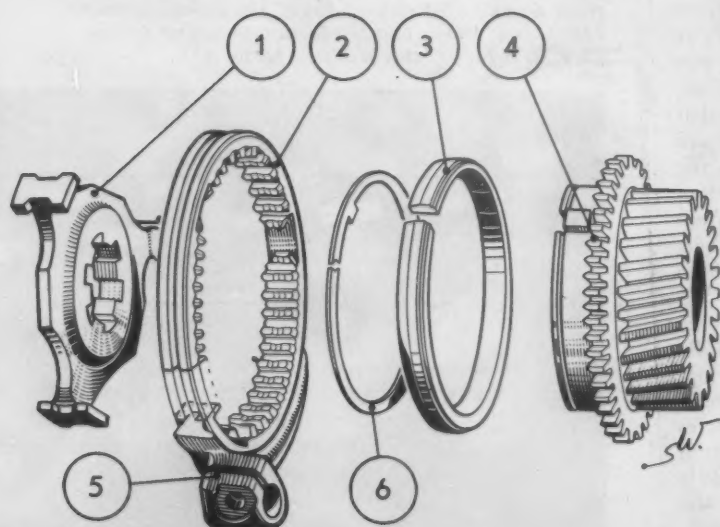
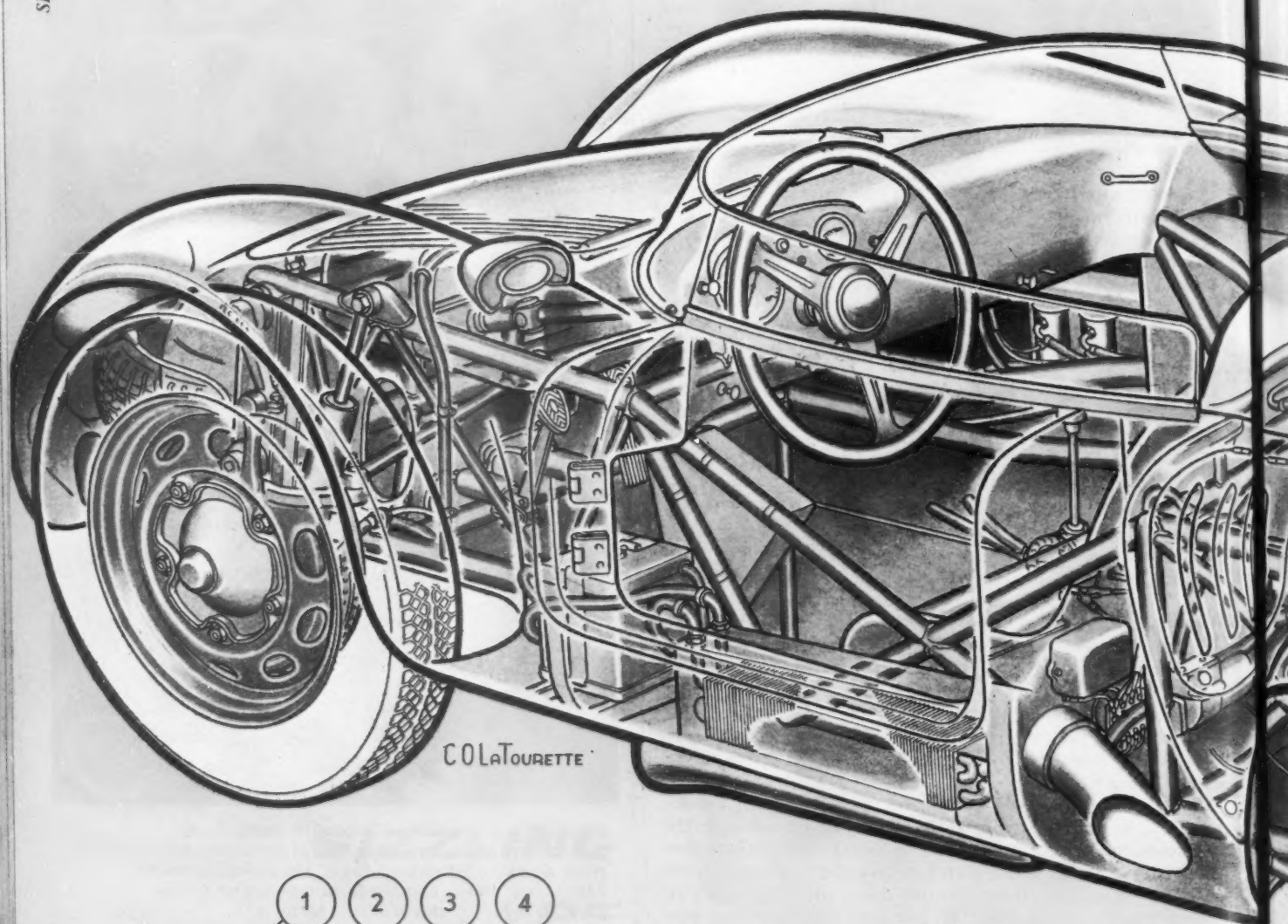
The resemblance of the very first Porsche to the Spyder layout has already been mentioned. The next "pseudo-Spyders" were the Glöckler-Porsches. One of them, developing 85 bhp on alcohol, set three 1500 cc International records in 1951 at Monthlery before coming to the States in the hands of Max Hoffman. Though carrying four-pin knock-off disc wheels of BMW 328 pattern, it too had a tubular frame and an aluminum body and the engine was in front of the gearbox.



*Opposite page, two Type 718s, with and without fins; behind them, an earlier RS Spyder similar to those seen in USA racing. Above, the Behra-Hermann 718, finless, speeds past less fortunate cars under the Dunlop Bridge at this year's Le Mans.*







Exploded view shows Porsche synchromesh. Shift guide 1 is splined to pinion shaft. Operating sleeve 2, which turns with guide, is controlled by selector fork 5. Outer surface of slotted servo ring 3, tapered at left to match sleeve, catches at right beneath undercut teeth of dog clutch on driven gear 4. Safety ring 6 prevents ring from slipping off, square block on 4 keeps it from spinning. Text explains operation.

# PORSCHE Type 718 Spyder

## SPECIFICATIONS

### POWER UNIT:

Type	Air-cooled, flat four
Valve Operation	Shaft-driven, four overhead cams
Bore & Stroke	3.45 x 2.60 in (87½ x 66 mm)
Stroke/Bore Ratio	.75/1
Displacement	97 cu in (1587½cc)
Compression Ratio	9.8/1
Carburetion by	Two Weber IDM
	twin-choke down-drafts
Max. Power	150 bhp (DIN) @ 7200 rpm
Max. Torque	117 lbs-ft @ 5800 rpm

### DRIVE TRAIN:

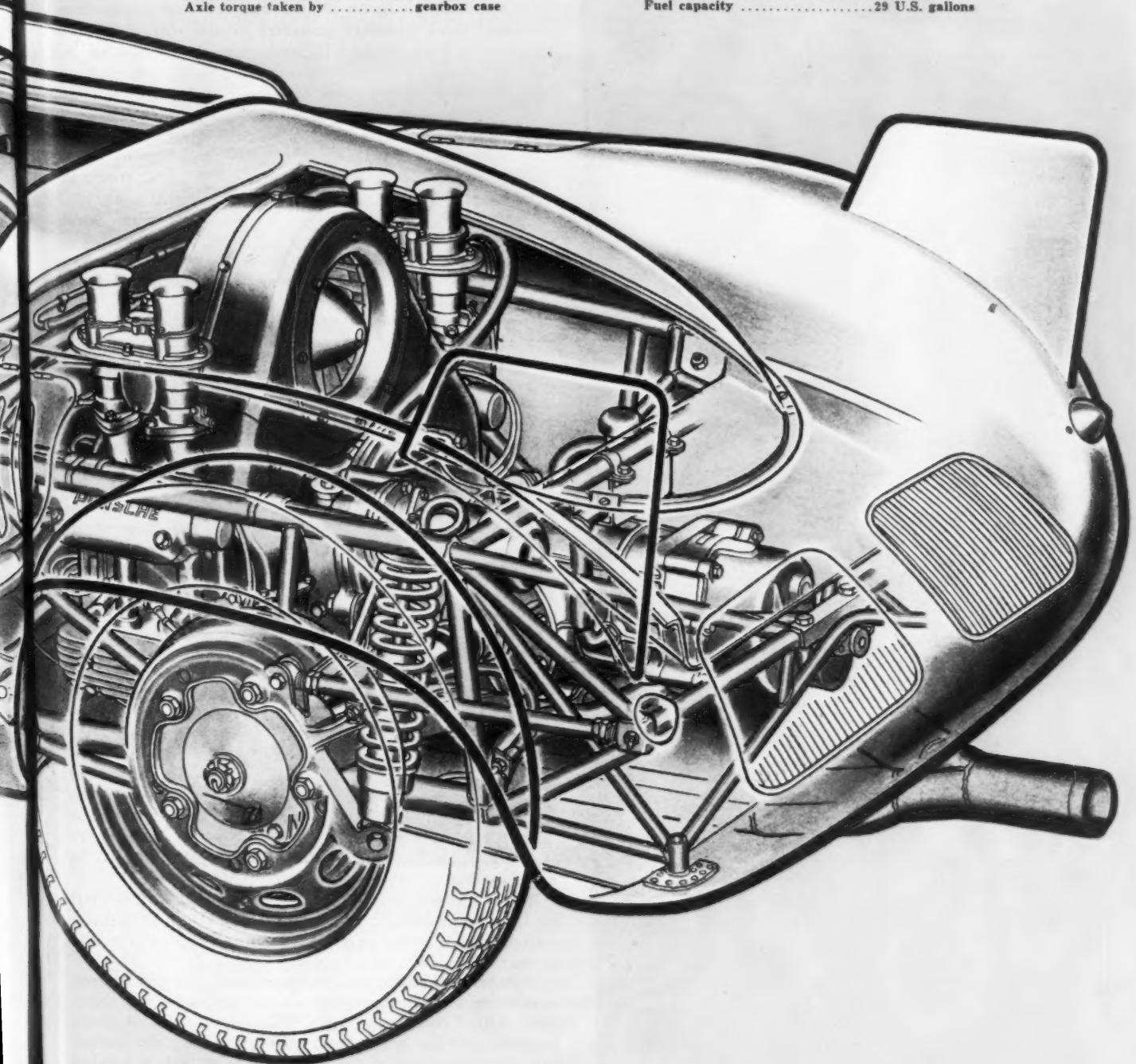
Clutch	Single plate, dry disc
Transmission ratios available	
I	3.09
II	2.13, 1.94, 1.76, 1.61
III	1.47, 1.35
IV	1.23, 1.13, 1.04
V	0.96, 0.885, 0.815
Final drive ratio	5.17, 4.43
Axle torque taken by	gearbox case

### CHASSIS:

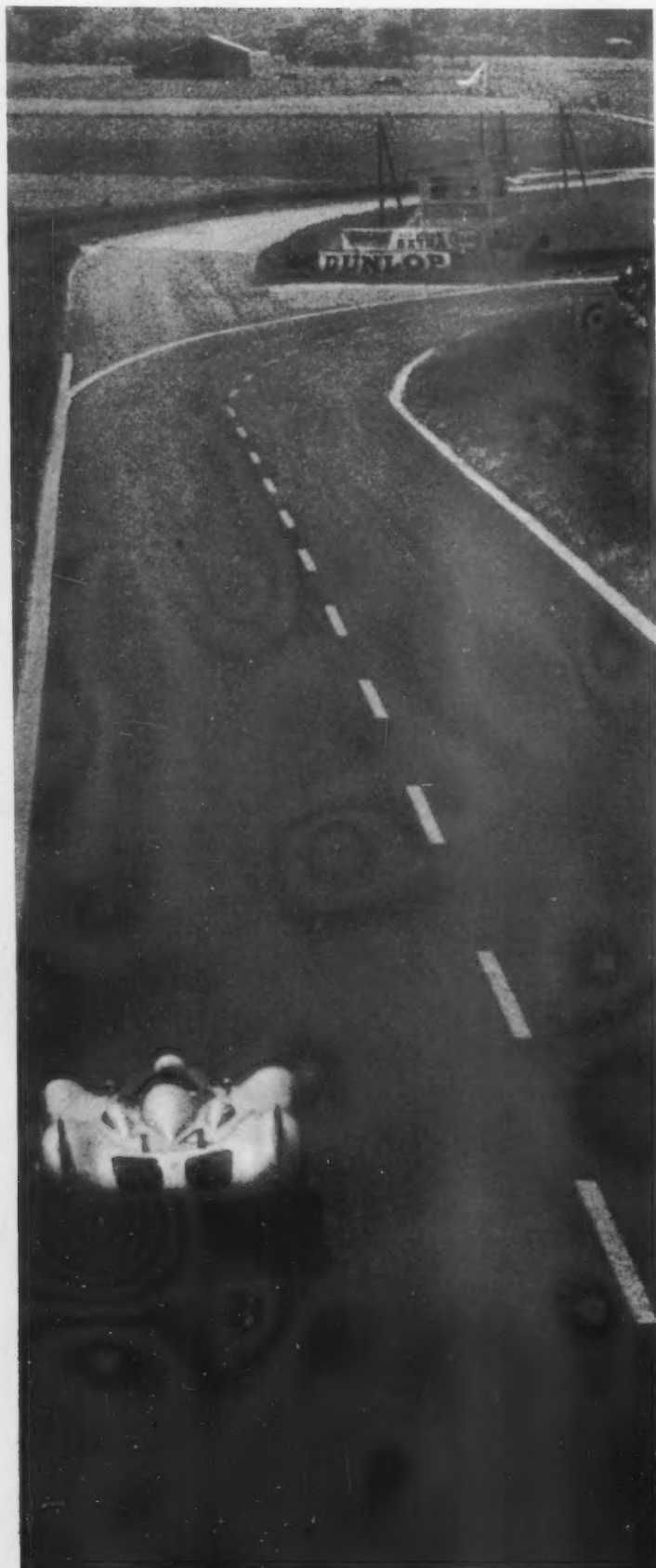
Space frame of	small diameter tubes
Wheelbase	83 in
Tread, front and rear	51, 49 in
Front suspension	Widely spaced trailing arms, transverse torsion bars
Rear suspension	Low pivot swing axle, fore and aft Watts linkage, coil springs
Shock absorbers	Fichtel & Sachs telescopic
Steering type	ZF worm and roller, steering damper
Turning diameter	36 ft
Brakes	2LS front, 1LS rear
Brake drum diameter	11 in
Tire size	5.25x16 (5.00x16 optional at front)
Rim size	3.50x16

### GENERAL:

Length	150 in
Width	58 in
Height	35 in
Weight, dry	1140 lbs
Fuel capacity	29 U.S. gallons



*Porsche's first real race car, the modified 718's single seat, narrow headrest reduce frontal area for even better top speed.*



Encouraged by Glöckler's success, but aware of his limited resources yet increasing competition, the factory built their first 550 Spyder in the spring of 1953. Work also commenced on a new flat-four air-cooled engine, to have two overhead camshafts per bank, but this wasn't ready until late summer. As it was, the Spydres were outstandingly successful with just the pushrod engines, winning several firsts and seconds that summer . . . Eifelrennen (Nürburgring), Le Mans, Avus, Nürburgring again and finally, the Freiburg-Schauinsland hill climb. The four cam engine first saw competition at this hill climb and, all too typically, finished third to the pushrod Spyder's first.

At first on the 550, as before, when the engine and gearbox were swapped around, the rear torsion bars were moved behind the axle line, too. But with longer flexible trailing arms (23.7 inches instead of 16.9), the torsion arms returned in midsummer to the more sensible location which creates toe-in on bounce and rebound rather than toe-out. Shock absorber geometry at the rear, none too satisfactory even on the VW, underwent several alterations, too. Eventually such a modification showed up as well on the A version of the Type 356.

In entering prototypes at LeMans, manufacturers once had to claim that these were the precursors of actual production models. Honoring this pledge, the Porsche works put the 550 Spyder on the market for a price (ex Stuttgart) of under \$7000. At least 100 were sold, much to the discomfiture of the SCCA, but in truth, only a few were equipped or seriously intended for actual road use. Shortly after the supply was exhausted (no kidding, the factory was losing money on them), the works team appeared with a newer Spyder.

The RS (for Rennsport) differs in many details from the 550, but it still takes a careful look to tell them apart out on the track. A super-low starting gear was added on the tail of the gearbox, but the biggest step forward was in the weight saving and stability departments. A space frame replaced the simple ladder-like one and to lighten the body, the flip-top tail section was abandoned. Instead, two large access panels, very aircraft-like, permit changing plugs or carb jets but little else.

To improve stability through turns, the roll center was dropped by using low pivot swing axles. The drive shafts were splined to give sliding freedom. The spare tire was moved from above the gearbox — another detail from Porsche #1 — to the front end. At first strictly not-for-sale, these too trickled over to the States as soon as the works had something better underway: the Type 718.

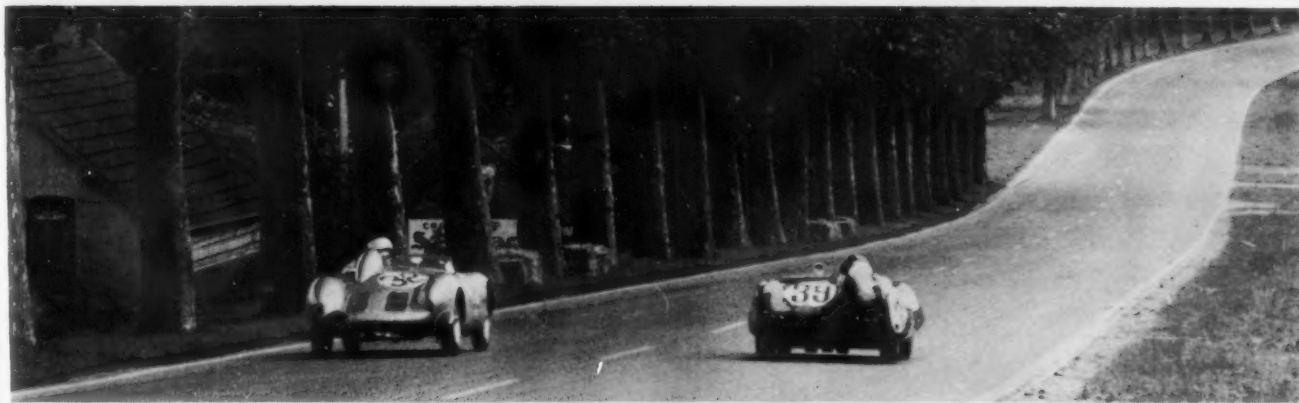
But having come so far, making something better was no easy job and a lot of experimenting has been going on. Testing of the Type 718 went on during the entire '57 racing season and most of '58's. Early versions were known as the RS2 and then the RSK, the K indicating the angle of the upper front torsion bars. These allowed wider spacing between the trailing arms and at first ball joints were used. These have since disappeared. Known informally as the "Mickey Mouse" car, it was anything but stable at high speeds, von Frankenburg's crash at Avus and Behra's eight full spins on Mulsanne Straight (despite tail fins) at Le Mans being rather spectacular proof of it.

But this year's sweep of third, fourth and fifth overall at Le Mans indicate that earlier difficulties have been solved, so it is fitting to give a technical rundown on the current Type 718.

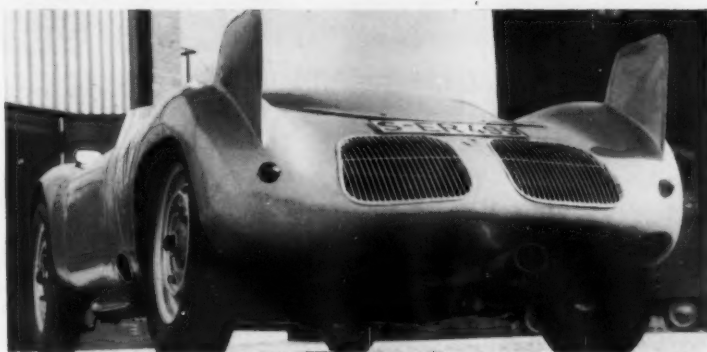
At Sebring this year, it was announced that coil springs were being used at the rear instead of torsion bars. A sharp break with Tradition (and the Sales Dept's point of view), it eliminated the heavy cross tube containing the torsion bars. The outer end of the low pivot swing axle is located by a fore and aft Watts linkage (see Technotes for August and this month). The sliding spline on the axle shaft itself is gone in favor of a spherical pot-joint at the inner end, a variation on the sliding U-joint used on the VW.

*(Continued on page 56)*

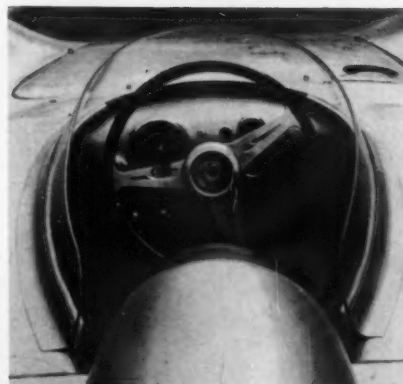
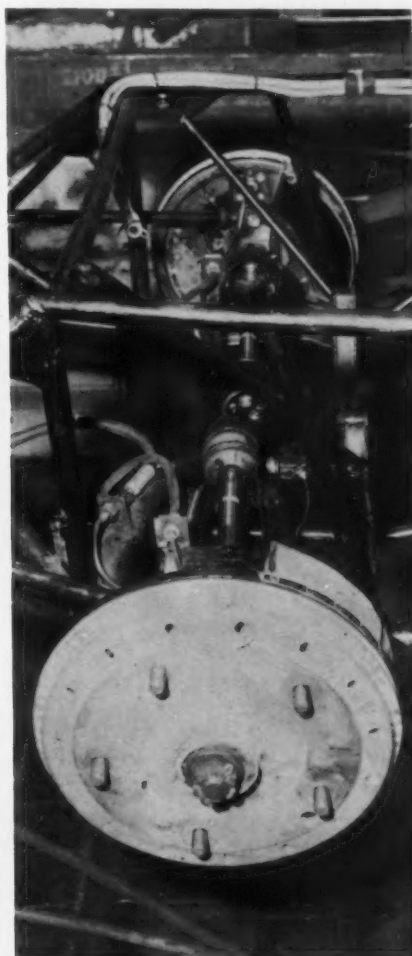




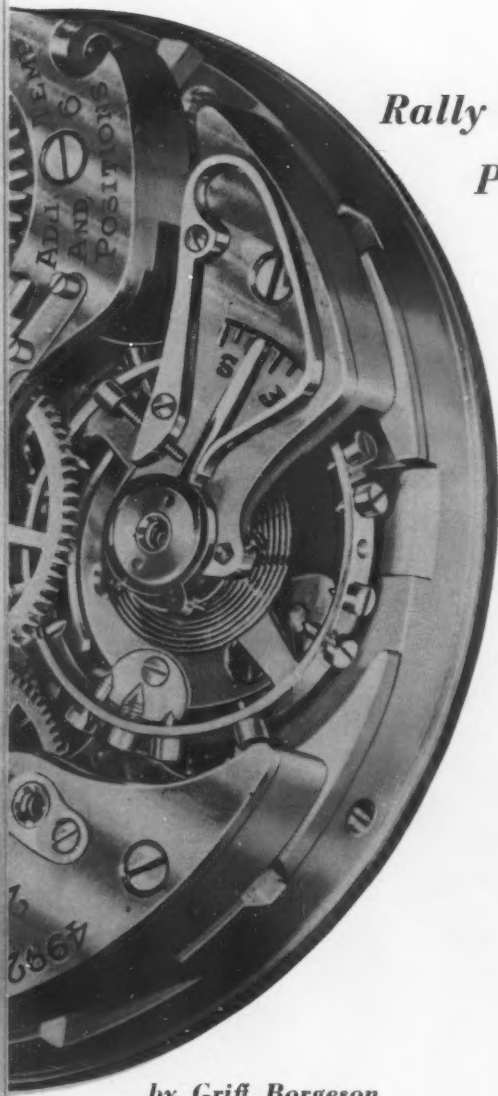
The last step before the 718, the RS still had torsion bars at the rear. Here de Beaufort-Linge's RS overtakes an 1100 Lotus



Above, top, the 550 featured a flip-top tail section long before Marlboros did. Middle, in a similar 550, Racing Manager Hüsckhe von Hanstein shows himself to be no pit-bound strategist. Below, the value of fins on 718 is disputed by team drivers. Some like them, some don't. Aesthetically? Hmmm. Perhaps someone's kidding Detroit. Right, low pivot swing axle requires two U-joints per axle shaft. Inner one slides in and out, like similar joint on Volkswagen.



With central seat and altered engine cover, the Barth-Frere Le Mans car (1498 cc) became Behra's Formula 2 mount at Rheims. He won very handily.



*Rally Competition Demands The Best Timepieces . .  
Photo Timers And Alarm Clocks Won't Hack It.*

## PRECISION RALLY TIMING



by Griff Borgeson

*Heuer makes a line of timers that have been designed specifically for automotive use The Autavia registers up to 12 hrs; available single or double: \$45.*

**S**AYS TIMING EXPERT Barney Feldmar, "We probably have the finest navigational rallyists in the world right here on the West Coast. I mean it . . . literally. These wizards are able to run a 10 or 12 hour rally with an accumulated error of no more than 11 seconds; sometimes only 8! And, they are known to zero in with *no* error on certain legs, and that's phenomenal. Other rallyists find that they are competing against people who are getting fantastically fine times and they want to know how it's possible. We can tell them."

Peter Bullard, General Manager of Robert Bentley Inc. says, "I don't want to start an East-West Civil War among rallyists, but Mr. Feldmar had better wait until the SCCA's National Rally championship is settled before

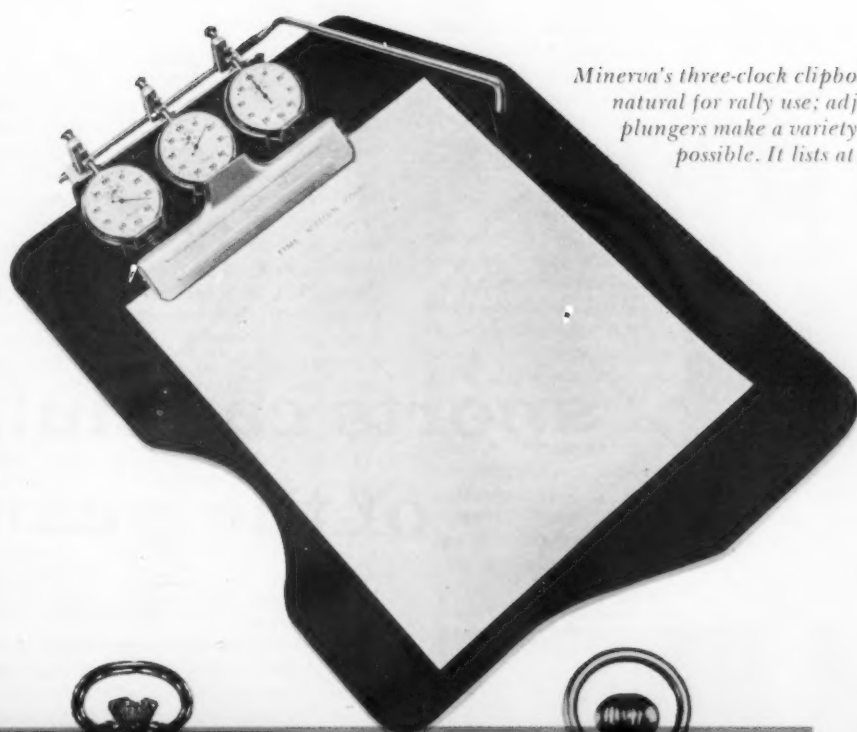
shrugging off the Easterners so quickly."

No matter where you live, you can still have every technique of the rallyist's art worked out to perfection, but if your timing methods are not precise, you're doomed to be an also-ran. According to Feldmar, there are probably only three systems of navigation being used by winning rallyists today. One instrument is common to all three and it is indispensable to each of them. It is the *Master Watch*. It usually is, and it should be, a pocket chronometer.

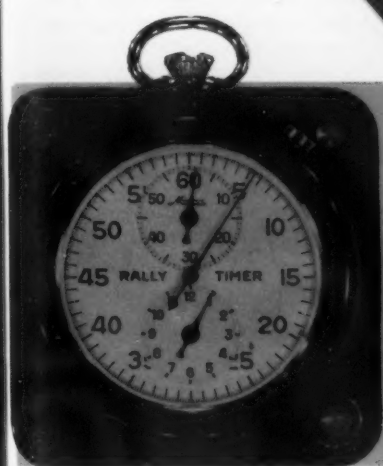
A chronometer is a very, very fine timepiece which has been designed, built and adjusted to perform with ultimate accuracy. It usually is guaranteed to operate in extreme hot and cold temperatures with a daily error of only a fraction of a second. It is timed and adjusted for a wide range of operating

positions so that the balance wheel remains perfectly poised in almost any attitude. A good pocket chronometer can be adjusted in one position to lose or gain only two or three seconds per week. A well-adjusted chronometer, even so, may be placed in a position that can introduce an error of the order of a couple of seconds in 24 hours. For rally navigation this is inconsequential.

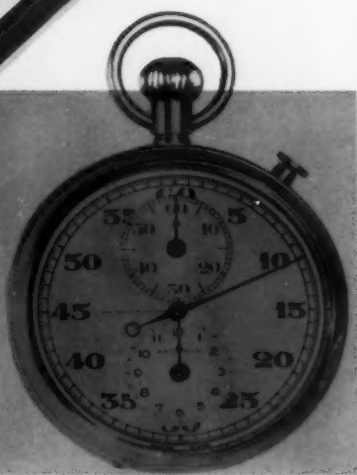
The chronometer is a most excellent timepiece and it should not be confused with the chronograph which, you will recall from the last installment, is a watch — usually of quite good quality — with stopwatch features added. However, a *fine* chronograph can be "tuned" to chronometer specifications and often is. Due to rigid Swiss government control, any Swiss watch identified as a chronometer comes with a solemn pedi-



*Minerva's three-clock clipboard is a natural for rally use; adjustable plungers make a variety of uses possible. It lists at \$24.75.*



*Minerva's equivalent is mounted for clipboard or instrument panel. Price: \$40.*



*Wakmann  $\frac{1}{5}$  sec. sweep hand, with 1 min. & 10 min. scales, has press-crown start.*



gree that lists and certifies details of its preparation and performance. Among the makers of fine chronometers are Breitling (Wakmann), Longines, Omega and Ulysse Nardin in Switzerland and Elgin and Hamilton in the U.S.A. The American makes and the Breitling are made to the high standards of the U.S. Bureau of Aeronautics. Feldmar favors the 24-hour Hamilton, with its 22-jewel movement and relatively modest list price of \$150. Expert Art Peck, co-author with David Hebb of "Rallies, Trials and Gymkhanas," prefers the Longines 145T 17-jewel split-second pocket chronograph in chronometer tune. It lists at \$235. The excellent Breitling, widely used for air and sea navigation, is priced at \$198 for the 18-jewel model and \$170 for the 17-jewel version. One way to beat these

high prices is to buy a used chronometer from a reputable dealer. Feldmar sells used Hamilton Master Watches for a nominal \$66 . . . when available.

You may be thinking at this point that such an outlay is preposterous when people are winning rallies using alarm clocks and photo timers. But the point is, they are *not* winning with this equipment, except in the case of a rare fluke. In his fine book, which is a *must* for every rally enthusiast, Art Peck has kind words for the \$8 Eastman Photo Timer. . . . at least for beginners. We agree with him that this is something of a solution for the impecunious. But it is not enough if you're concerned with being in real contention.

Why is optimum timing accuracy so crucial? Exact timing determines who wins and who loses in today's American

rallies. The determination of the time-goals for a rally are the responsibility of the rally master. When he lays out a route, he does *not* do it with a stopwatch, which may err by a great many seconds — 15, 30 or more — in 12 hours. He uses a Master Watch and a computer and, perhaps as an aid, a stopwatch. Consequently the entire rally is based and run on Master Watch time and it is run *to the second*. When you yourself run on anything else, you're giving away odds. The answer is to be just as accurate as the rally master. Use a good Master Watch and synchronize it with the rally masters' watch.

Of the three basic systems of navigation by which rallies are being won today, the simplest is the rally master's. This means running the entire rally on a single, fine Master Watch, computing

*(Continued on page 61)*



scuderia

# sports car club of the year

By Sherrie Zuckert

*Editor's Note:* During the last few years we all have watched what was once an activity for a man with a little individuality in his soul become too big for its britches. In the process even the meaning of the term "sports car" has been lost.

Somewhere along the line, the emphasis on the individual has been lost; activities, particularly that of racing for fun, are the property of an unknown, huge amorphous "they" that sometimes is vaguely referred to as "Westport" or "The Pharaos" or just "The Club." Very few members of the SCCA have been, or ever would be on a personal friendship basis with the officers of the club. Admittedly, bigness is power — the power to get things done. And they do get done — in a Great Big Way.

And that is just the trouble. Where today can an ordinary member with an ordinary sports car compete in friendly race, rally or other event without that sinking "what's the use" feeling? Until very recently, unless he lived in Southern California, he couldn't.

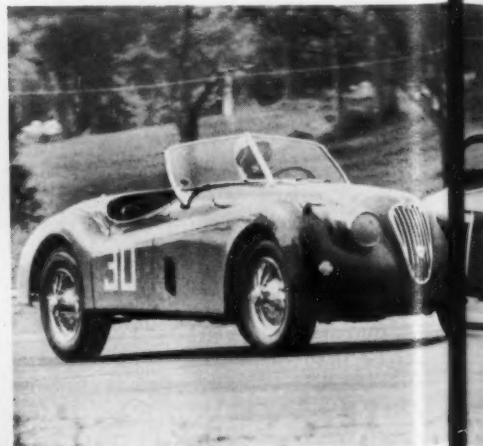
In the last year, however, there has been a resurgence of the old feeling that the individual had best guide his own



Fred Aibel (with beard under fender) and friends prepare Corvette for road after Lime Rock race.



ABOVE: Ray Aibel's white Jag partially obscures Bob Otten's red #30, as crew tries to force regurgitation of swallowed valve. ABOVE, RIGHT: Pat Boyle (flags) and Helen Franke (phone) man (or lady, if you wish) stations on course. RIGHT: Jerry Schweizer chalks one board while Ed Parker signals position "first" to Gary Georgi in Jag Special.



destiny, that Bigness had its penalties. Small groups are again starting as they did several years ago to hold speed events unbeholden to any but themselves and responsible to none but their fellow citizens.

To foster this movement toward club activity, Sports Cars Illustrated has decided to nominate annually one club which in the opinion of the editors has shown the most growth and the most activity over the course of a year. The club need not be large to qualify — in fact the larger the club, the harder it must work to make the grade. Some time ago we assigned Sherrie Zuckert the job of checking up for the first SCI Sports Car Club of the Year. A lot of club names were tossed into the hopper — all of them excellent clubs with records of activity that made them outstanding. But some had been in business too long, some had been active but had not grown, had not "sold" more people on motor sport activities. Some had just grown, period. Finally Sherrie came up with one club that had come up from absolute obscurity in a state noted for restrictive laws on the sport to become one of the most active and largest of the smaller clubs in the East. Its members are in demand by other clubs, even the largest, as participants and entrants in all forms of speed events. It is a "working club" in the truest sense of the word. The editors unanimously concurred with Sherrie's recommendation. Here is her report.

**I**T HAS BEEN SAID that when two people who own sports cars get together there is a conversation, when three meet there is a debate, and if a fourth arrives there is another sports car club. In this case ten people got together on a cold night in March 1955 and formed a club which was later to be named Scuderia X. At the time, the only assets of the new club were the spirit of the ten and their homes. Meetings were held at these homes and activities were limited pretty strictly to bench racing sessions.

The meetings were heated in those early days by a split decision as to club policy. One faction wanted the club exclusively male, and at that, limited to males who actually owned sports cars. The other side was for open membership for anyone, male or female, who was really interested in the sport—whether he or she owned a car or not. The first group contended that the whole purpose and idea of forming

a club was for devotion to pure speed events—if they couldn't put them on themselves then they would volunteer to assist older and more established clubs that were running such events. It was this doctrine that individualized Scuderia X from "just another sports car club". But there were still arguments with both sides holding out for their own ideas (by now the club had grown in membership) and it began to look as if three months was as old as Scuderia X was going to get.

Then in August of 1955 one member decided to either split the club entirely or consolidate it completely and set up Scuderia's first rally. The rally ended at a restaurant in Bardonia, N. Y. and a meeting of the club was held there. It was this meeting that decided Scuderia X's future as a club. One member denounced the club administration (the group that allowed only males with cars) and made a motion that the club be disbanded as it stood. This was seconded and unanimously accepted. Immediately, another member motioned that a new Scuderia X be formed. The motion was also unanimously accepted, and a new set of officers was installed on the spot.

The name Scuderia X was officially adopted at this time. Scuderia being the Italian name for "racing stable" and the Roman numeral "X" so to represent the original ten members.

From the formation of the "new" club a more democratic organization took shape. It was found that there were many members who wanted to participate in events such as rallies and gymkhanas as well as high speed meets. The desires of all were taken into consideration and the club began to run these events as well as social activities. Many of the members caravanned to almost all of the races in the area on numerous weekends.

Scuderia X retained the original high speed spirit, and in 1957 formed its own competition team. This team consisted of about a dozen drivers. All needed equipment (welding tools, jack stands, tools and two panel trucks) was made available to this team by club members. The club went full-out in cooperation and all technical knowledge of the members went into aiding the team in tuning their cars for competition.

The first few events were hill-climbs and speed trials in New York, New Jersey, and Pennsylvania. Then the Long Island Sports

(Continued on page 48)

Starting from the back of the pack, Bob Otten took the Jag Special up three or four places by the time they hit the first turn. Signaled "first position" on the twelfth lap (opposite page, bottom) he kept it that way 'till the end of the race. **BOTTOM:** The Scuderia goes racing as a club, with at least one club truck bringing all the encumbrances too big to jam into the cars, which drive to the track, race, and then drive home again.



**LEFT:** Otten's #30 takes the pole while Bob Grossman's 150S Jag takes the outside. Grossman's car was faster, but Bob Otten drove very well and at one point it looked as if he would take the S-Jag on the turn at the end of the straight. (He didn't, though). Club badge (left) can be found on the front bumper of Scuderia X cars (see Corvette, opposite page).





*Big-time rallies are held despite weather conditions and over rough terrain, the worse, the better.*



## RALLIES WORLD WIDE

*by Arthur G. Peck*

*"Why this road and not some other?"  
"Two roads diverged in a yellow wood,  
And sorry I could not travel both."  
—Robert Frost.*



UNDOUBTEDLY he didn't realize it . . . but Jules Verne was the father of the rally when he invented "Around the World in Eighty Days." Phineas Fogg ran one of the world's longest rallies — the "find your own route" kind — with only his time limit at the finish line to worry about. That he came in under the deadline is history . . . and the fact that he was his own navigator (he didn't have to do any driving) is firmly established.

Not so well recorded is the history of more conventional rallies — the kind that use automobiles — but it is known that competitive events were held in Europe before the turn of the century. And in the United States, just after the turn of the century, early efforts such as the Glidden Tours were forerunners of this currently popular form of automotive sport.





European rallyists come prepared for emergency and often find it. Tackle for pulling the car out of ravines is almost a standard rally accessory.



Timing at check points is handled in a professional manner in the Monte Carlo Rally. The Longines computer-timer prints an unarguable leg record.



Professional equipment for the Monte rally includes lighted magnifying box for map reading, detailed maps, two chronometers, photo-timer, Speedpilot.

Now, there may be an SCI reader somewhere within our ever-shrinking world who doesn't know what a sports car rally is. For him we quote one possible definition from the rallyist's "bible", *Sports Car Rallies, Trials and Gymkhanas*: "A rally is a form of automotive test in which cars leave a starting point individually, at a carefully recorded time, and are directed to follow a more or less complicated route to a finish — at which point all the entrants 'rally'." Or . . . think of the bus driver who guides his vehicle across several states, tackling problems of traffic and weather, but arriving on time at all the way-stations and his terminal point. Turn our bus driver into a sports car driver, give him a strange route to travel with all information withheld until one minute before starting time, expect him to be on-time-to-the-second at all of his unknown "way-stations" (called controls or checkpoints) and then multiply him by 50 or 75 for competition and you come up with a pretty accurate description of a Sunday-afternoon rally in this country.

But not so in the big continental championship rallies of Europe. And not so in the 'Round Australia 10,000-mile endurance run. For rally variations are infinite and many versions have developed 'round the world. And the influence of a country's automotive industry, its topography and its traffic laws is reflected in the widely-differing "rules of the game." Let's start our comparisons at the "summit" so to speak.

The world series of rallying is the European "Touring Championship" circuit authorized each year by the worldwide governing body of automotive sport, the F.I.A. (*Federation Internationale de l'Automobile*, with headquarters in Paris). This circuit consists of 12 or so events each year — only one assigned to any individual country — that are truly international and that pull the cream of the continental rallyists and rally cars. And, as opposed to U.S.

practices, goodly sums of prize monies are offered and fully-factory sponsored teams are the rule, rather than the exception.

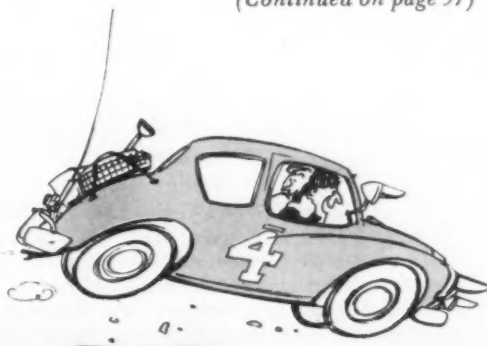
Truly tough challenges of man-and-machine, these rallies average 2500 miles in length and usually utilize most of the rugged Alpine passes in one method or another. And until recently, continental events reflected the "no maximum speed limit" of the majority of European countries and became tests of flat-out driving to make a hard-to-meet maximum-time deadline . . . but with no penalty whatsoever for arriving at any given point early. In fact, most of the time schedules (and the roads chosen) were so tough that it was almost impossible to remain penalty-free, no matter how fast the speed and how hard the driving. Those lucky enough to "get a pocket full of time" made the most of it to make any necessary repairs to their cars . . . or to snatch sorely-needed rest; little-or-no sleep was all a part of the plan of the organizers.

But this "endurance run" alone wasn't enough. Soon, all of the big rallies were adding speed tests of all kinds. Timed hillclimb sections of the worst of the mountain passes became commonplace . . . and it was a sad affair in the summer events that didn't have all-out timed laps, if not races by classes, on one-or-more of Europe's most famous courses.

In England, things were different. Timed laps on race courses were all well and good . . . but high speed on public roads? No. The tight little isle had too much traffic per mile of narrow road for any such freedom of movement — not to mention a lack of "everybody's a race driver" spirit found in many of the continental countries and so the British rallies ran within fairly narrow time limits, making it mandatory that rally cars arrived neither too late, nor too early.

It was after the Hitler war that returning G.I.s helped swell the ranks of the few pre-war sports car enthusiasts in

(Continued on page 57)



Boy, are those jerks lost!

STAN  
MOTT



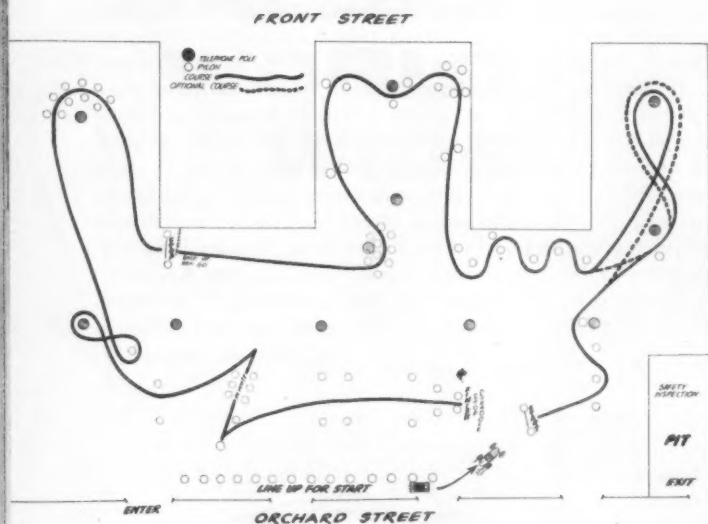
Photos by Irving Dolin



Gymkhanas can be held on any sort of surface with any sort of marker and run with any agile vehicle—the whippy MG is a natural for this.



## rally 'round the pylon, boys



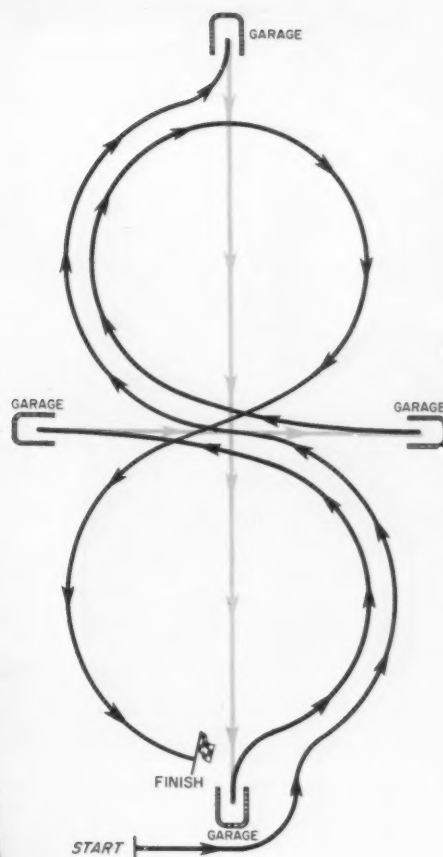
Here is a typical set of gymkhana directions, a map of a parking lot at a shopping center on L. I. Cars were timed thru the complicated course, seconds added for each rubber pylon or cone knocked over or displaced. No points off for phone poles, just panel-beaters' bills. Route can be longer or shorter to suit the size of the area involved. Course could be made fast or slow by adding or removing route pylons or by changing the stop and reverse sections to suit needs.

THESE ARE A SET of directions handed out just before the running of one of many many gymkhanas. Confusing? You don't know how confusing confused can be. The above directions are for an *easy* gymkhana.

But let us start at the starting line. A gymkhana is an animal that comes in varying degrees of fur. From simple figure eights to not so simple circles and serpentines (with backup garaging yet) to hairy just-short-of-a-mile events with a flat-out stretch at the end before a screeching stop straddling the finish line. Along the way of most of these melees there are such diversions as backing up and touching a flag based in a rather shaky tin can (touch it—don't knock it over or it's a penalty and oh yes, no looking backwards please—use your mirrors); do a complete "U" and stop once again straddling a line (be sure to *straddle* it, if your wheels touch it's more points off); pick up a tennis ball from one pylon and rest it gently on another, and do it as fast as you can because the event is against the clock you know. All of this is designed to test 1. the driver's skill, 2. the car's dexterity, 3. the entrants' vocabulary, as the flagmen and observers sometimes hear the damndest things over the "crunk" of a pylon being run over (usually ten points off).

The roar, whine, and buzz of present day mounts are a far cry from the thundering hoof beats and what have you of the origin of this particular phase of sport. Gymkhanas started in the days of the Bengal Lancers. These worthies when not defending India, had lots of time to kill so one day one bet another that he could spear rings while charg-

Art Peck backs into one of the "garage" sections of the problem shown at the right, using directions given by Caroline Hebb who acts as navigator. Course could also be driven by lone driver.



by Sherrie Zuckert

ing at full speed. The game caught on fast and finally resulted in regiment contests—spearing lemons, picking up rings, full gallop eights, and all kinds of whoop-de-do.

Long after India was safe and the Lancers' only appearances were in parades, people with dextrous little motor cars decided that it might be fun to try the same kind of tricks . . . it was. Gymkhanas today are a standard and looked-forward-to item on all sports car clubs' agendas. In European type rallies, they are a part of the "tests" for the finalists, in the midwest they are a "social do" with the appeal and attraction of major races, in California—well they're pretty wild in California.

Basically, gymkhanas come in two forms—with navigator or without. The "with navigator" is a bit misleading, as this is usually a gimmick affair and the navigator's valiant part could consist of: washing the driver's face (with burnt cork); directing a blindfolded driver through "esses"; standing on his hands on the hood of the car while the driver negotiates a U turn (this is a trick popular in England where they are right near the factories that make some of the aluminum cars in the first place); and oh yes, spearing potatoes, picking up milk bottles, feeding the driver saltines (against the clock you know) and all kinds of normal domestic things like washing sheets and what ever else they may think of in Hollywood.

As for the without navigator—this is more likely a test of genuine driving skill and car. The weathered (and weathered is the word because akin to mailmen nothing coming down, blowing up, impending or there, can stop the U.S.

mail or a gymkhana) gymkhanaers have their own set of competition preparations. Front tires are blown up to 50 psi, windshields are removed or put down, safety belts are installed (nothing more comforting than sliding the length of a seat and back at 30 mph while trying to concentrate on threading through pylons), some even go so far as to install "suicide knobs" on their steering wheels—but this is going awfully far.

For those who are not fanatic silver seekers, a gymkhana is the epitome of pure sports car sport—the kind where you load girl, food, and dog into your everyday sports car, drive out to some vast parking lot and run your heart's delight out of each, with no modifications required. These pylon parties are great equalizers, for in most cases, size, engine capacity and cost of a car matter not one whit (whatever that is—nonetheless it doesn't matter)—what counts is driving skill. If one car can get down the end "straight" a little faster 'cause it's big, another car can go through the pylon mazes a little faster 'cause it's small.

Gymkhanas are basically quite easy to construct. They are usually held in parking fields of shopping centers or industrial buildings. When planning a gymkhana first the area of combat is "sized up" as to telephone and utility pole locations and any other natural obstacles that may be present. Measurements are recorded and then the team running the affair goes home and plans a course on paper. Then, back to the parking field with a trunk load of rubber pylons, and the course is tentatively set up. Changes

(Continued on page 46)



## PUT-IN-BAY

(Continued from page 23)



Perry's Monument overlooks open-field pits.



The "big" cars bore into the fully-curbed start-finish straight. A hydrant is hiding behind the bales.



Styling applies numbers; engineering installs shocks; privy reassures both.



Race-bound, Al Allin's Alfa and Ed Lidgard's Volkswagen board ferry.



Hairiest race by far was G & H Prod. event, where everything from Morris Minor to Alfa Spider bore down the straight, bottomed and slid over the choppy braking area, and somehow managed to single out either through turn or down escape road.

in handcuffs, by two burly officers.

But a race is only a race without the little things that make it different from every other one. This one had Lonz' winery, where everybody consumed many liters of champagne, vintage '58; air-ferry service to the island via Ford's literally very first T-Birds—corrugated tri-motor aircraft, vintage '27; taxis that took anyone who could find a place to sit at a quarter a head, vintage '32 & '34; a Ferrari "America" whose prosperous owners had to sleep on the grass on the town square because the hotels were full; the flat-rate \$58.50 for unofficial moonlight pre-race practice; and only two American cars on the island, brought by the Fury-driving Associate Editor of SCI, and by a Buick-driving Volkswagen-sales manager from Ohio.

Lots of fun at Put-In-Bay? Yes, but don't get too excited about coming next year, unless you're willing to catch a Thursday ferry, probably sleep on the grass, and help clean up the champagne bottles around the edge of the course. There's never a beer can in sight. Mr. Lonz sees to that.

Len Griffing

## Gymkhanas

(Continued from page 45)

are made, new ideas are added and eventually the whole thing is drawn up in map form with directions underneath, and mimeographed. The basic forms are many. Serpentine where pylons are set up in a straight line with just enough space for a car to weave through them between each. Corners are taken care of by a "C" with pylons in a double line (with just enough clearance for both sides of a car) forming that letter. A bonafide parallel-parking space is also constructed out of pylons, and a map of the course shows on paper just what route *must* be taken from problem to problem. If this route is deviated from in the least it can be so many points off that nothing else matters, or the car may be disqualified as being "off course". Starts are accomplished by the driver himself starting a timing watch held by the timer; Le Mans type, or just plain waiting on the starting line until a flag is dropped.

Along with the more serious navigator-less events have been such problems as three sets of pylons in a line about 25 feet from the driver who, sitting in his car, must gauge and instruct as to just how far apart he thinks the pairs of pylons should be so that he may drive through them without touching. Points are added per inch off of the drivers judgment, and if he runs a couple of pylons over it is, of course, ten points for each. If the organizers want to be real nasty about things they might ask a contestant to tell them how much pressure he has in his spare tire—with points for each pound miscalculation. One club went so far as to rent a trailer truck and have each contestant try to back the thing into a pylon garage before he could get into his own car and proceed with the event. From problem to problem there's even a stickier problem — the course you must follow. This is a prescribed pattern, that must be adhered to, that winds from pylon to post usually in a most intricate manner. As directions are handed out about a half an hour before the event, contestants can be seen walking their versions of the instructions. As this walking the course is done with heads bent over the direction sheet, occasional collisions occur when a few decide to learn the course by trodding it backwards—tender romances have been known to begin in this manner and others to end.

Now about scoring and timing. Gymkhanas are run against the clock—contestants running one at a time or at safe intervals. If the course is exceptionally long, everyone runs the same course. For shorter patterns, two (or even three) identical courses are set up and three cars can run simultaneously, providing a rather wild panorama for the spectator. The person who gets through the course in the least amount of seconds has a pretty good chance of acquiring a new doodad to polish—that is if he has gotten through clean, with no extra seconds added to his score for misdemeanors such as running over pylons or knocking things down. Usually it is ten seconds per pylon, 20 seconds for not straddling a line prop

(Continued on page 48)



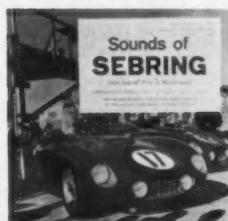
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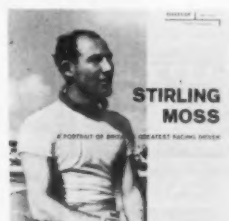
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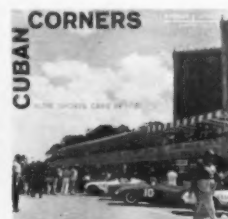
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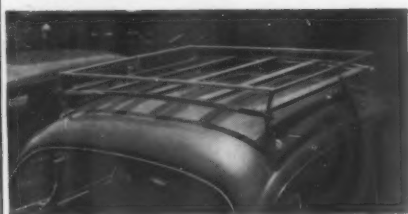


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## Gymkhanas

(Continued from page 46)

erly, 5 seconds for improper parking, and penalties along those lines. Although a fairly good driver can gather a very low time, he can be completely out of the running due to penalties on carelessness. Marshals are stationed in strategic spots and they are the ones who record this type of thing.

Some clubs go in for elaborate timing equipment and gimmicks which involve weeks in construction and planning, but this is really unnecessary as one watch per course does very well and simply. Timing is usually to the tenth, and fractions of seconds count dearly when competition is close — your author having once lost a first place by 1/10 of a second.

As you may have ascertained by now, those Bengal Lancers really started something—one wonders however, what they used for pylons after they captured India.

Sherrie Zuckert

## Scuderia X

(Continued from page 41)

Car Association scheduled a series of drivers' schools and races. All of the racing team qualified for competition licenses, entered, and fared extremely well in the LISCA races. In addition, Scuderia X volunteered its manpower for the jobs needed to put on a race.

To do this, organization for high speed instruction was started within the club. Flag and phone schools were held for members interested in this facet; timing, lap scoring and technical inspection procedures were explained to others. At any of the LISCA events you find Scuderia X members at flag and phone stations along the track, timing in the observation booth, helping at technical inspection, and observing (during driver's school) in cars on the track or at stationary observation points around the track. In addition, Scuderia donated its truck for use in these races.

At one race, participants were startled to see a number of people sitting on the upper branches of a tree near the course. From this precarious position, Scuderia X members were carefully scrutinizing what was going on on the track, acting as voluntary observers for race procedure.

When the Scuderia competition team grew to about twenty-five drivers, it was decided that the team divide itself into small groups, thus establishing sub-competition teams and creating intra-club competition. The team does very well at races sponsored by other organizations and it is its hope to encourage other clubs to set up similar competition teams and thus establish true club racing throughout the East.

The intra-club rivalry is strong indeed where competition points are concerned.

(Continued on page 49)

# GREAT!

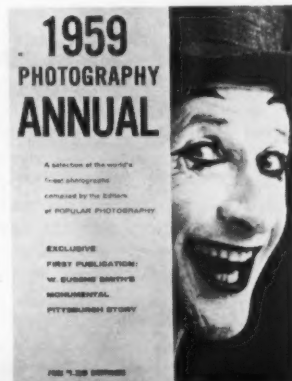


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## Scuderia X

(Continued from page 48)

The prize is worth the struggle, too. The team that garners the most points during a given season becomes the next season's leading team, the one that officially represents the club in national events and in meets run by other clubs. Thus the club can field the most efficient team they can muster from their own ranks and at the same time keep that team on its toes.

It is this incentive that makes Scuderia X a real "working" club. Unlike some other clubs where a member will do something only if drafted or if it will glorify his own name, Scuderia members have one sole purpose—to further sports car activities as much as they can and in such a way pursue the sport with the spirit that first prompted the formation of their club.

There are many clubs in the midwest and on the west coast which have done constructive things and have gained a certain amount of fame (or notoriety) through these activities. There are also many, many clubs which started out with the same spirit as Scuderia X but gradually found this spirit had become secondary to a loaded treasury.

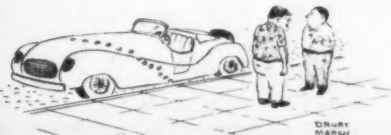
But few have set up their own technical inspection station so that cars in their area can be inspected one day prior to the race weekend and thus eliminate some of the inspection problems often encountered at the track.

From ten members in late 1955, Scuderia X has grown from total obscurity to become one of the best known clubs in the Eastern Conference of Sports Car Clubs. This is most vividly illustrated by the fact that this year when the Long Island Sports Car Association decided on a heavy schedule of serious racing, one of their first acts was a formal invitation to Scuderia X for cooperation and assistance.

Today, racing in the United States has become more and more muddled due to the intense fight over professionalism. To show up with last year's hot car means only third or farther back placing, so Scuderia X has started to return to what the whole thing was about in the first place. Sports car racing, to Scuderia X, is for the man who drives his every-day sports car to a track, races it, and drives it back home to work on it himself.

And club activities, to Scuderia X, mean activities for everyone in the club. On this policy, that of a return to competing for fun, to driving and competing for kicks and cups alone, Scuderia X has prospered and become, in little more than a year—and in spite of restrictive New Jersey laws hampering automotive sports—one of the strongest voices for motor sport in the East. For these reasons alone, SCI is proud to nominate Scuderia X as the 1958 Sports Car Club of the Year.

—Sherrie Zuckert



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## Le Mans

### The Cars

(Continued on page 52)

Porsche's 1588 cc Type 718, right, lost its chance for second spot with this halt to swap a front drum. Below, top-line drivers are not too keen on night racing for it really wears them out. Phil Hill at one AM tells Dan Gurney what he's missing. Bottom, von Trips' face shows strain of three hours in rain at night.



#### RESULTS: 1958 24 HOURS OF LE MANS.

1. Hill/Gendebien (Ferrari 2,953)
  2. Whitehead/Whitehead (Aston-Martin 2,992)
  3. Behra/Hermann (Porsche 1588)
  4. Barth/Frere (Porsche 1498)
  5. deBeaufort/Linge (Porsche 1498)
  6. Beurlys/de Changy (Ferrari 2,953)
  7. Hugus/Erikson (Ferrari 2,953)
  8. Bolton/Stoop (AC-Bristol 1971)
  9. Pathey/Berger (AC-Bristol 1971)
  10. Colas/Kerguen (Porsche 1498)
  11. de Tomaso/Davis (Osca 749)
- Fastest lap: Hawthorn (Ferrari) 4 min. 8 sec. = 121.42 mph.

Among the less novel nameplates, Ferrari stood out both in number of entries and in finishing position. Concerning the engine, front suspension, and portions of the bodywork, the factory Ferraris are kin to the production Testa Rossas; but many other features are different. One is the use of a de Dion rear axle located by parallel trailing arms and hung by a transverse leaf spring, in conjunction with a rear-mounted gearbox placed — traditionally Ferrari — just ahead of the differential. The front brake drum faces are simply vented by big drilled holes, while the drum rims have shallow, crude transverse finning and a meaty cross-section.

Having introduced the cut-away front contour for brake cooling just a year ago, Ferrari's works cars returned to rounded snouts with smaller radiator openings and separate ducts to the brakes. The carb bulge with rearward-facing air aperture was incorporated in the winning car and the Collins-Hawthorn record-setting machine, as per experiments on the Dino series sports and G.P. cars.

The Chinetti-entered car that was so beautifully handled by Dan Gurney and Bruce Kessler was last seen as a factory car at the Nürburgring. Though it looked "stock" Testa Rossa except for right-hand-drive, it shared a de Dion back end with the factory Ferraris but had its gearbox in unit with the engine, and was thus very much a Maranello Special. The six other Testa Rossas were the standard LHD car, all having simple circumferential brake drum finning. Half of them had smooth unvented brake drum faces, while the others had the centrifugal venting dating back to 1950. The Ferrari entry was rounded out by a single Testa Rossa of the old two-liter four-banger type, modernized by the latest in cutaway fenders.

All the pre-race form on the basis of sheer velocity was Aston-Martin, who fielded three DBR1/300 cars just as last described in SCI. They all had the alloy four-bearing blocks capped by the 95-degree heads which were experimental last year but which have now been standardized. Three twin-throat Weber carbs were used. So far the performance of the three-liter version of the seven-bearing DBR2 engine has not been good enough for a

Championship race, which is a pity since, as I said last year, three more bearings are what Astons need.

The 2nd-place Aston? To the best of my memory it was practically identical, but slightly inferior in distance covered, to the second-place finisher in 1956. Though it was a good day out for the Whiteheads, this does not constitute progress down at Feltham. Just as raced by the factory in '56, #5 had an iron crankcase, old-type twin-plug head and disc brakes. A Mercedes-like refinement on this car was the fitting of a small window near the top of the fuel tank as a guide during quick fill-ups. The new Astons also had specially painted slots under the front for instant insertion of the wheel jack.

It would have surprised nobody if Porsche had won the race. Finishing third and placing four cars in the top ten is just an ordinary weekend at Le Mans for them. Their two best places were taken by RSK's of the latest type, the Behra/Hermann car having the 1588 cc engine. This car could easily have finished second had it not been for a malfunctioning in the brakes which prevented proper withdrawal of the shoes and led to the complete wearing away of the left front brake lining. Both shoes and the drum were replaced during the race, and another set was ready had the right front needed it too. Porsche front brakes are large and helically-finned, but so completely shrouded by the wheel that one wonders if cooling is adequate. Of course the face of the drum is exposed through the use of a large bolt circle.

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(Continued on page 52)

## Le Mans

The Races  
(Continued from page 27)



Moss leads thru esses on opening lap.

midnight when the Hamilton-Bueb Jaguar passed Gendebien. The Hawthorn/Collins Ferrari retired early in the morning with the clutch gone. The Trips/Seidel car went into the sand at Arnage shortly after midnight as Seidel attempted unsuccessfully to get around two slower cars blocking the road. The Hamilton/Bueb Jaguar made a pit stop at midnight; after this it never caught the Hill/Gendebien Ferrari, despite the optimism of the English commentator. By noon on Sunday, Hill had come up behind Hamilton and was about to lap him again. But the Ferrari stayed behind, Hill merely keeping the Jaguar in his sights. This undoubtedly harassed Hamilton and he tried to increase the gap. In doing so, he slipped up and left the road violently at Arnage, the car going end over end, finally coming to rest upside down in a ditch. Hamilton was just able to crawl out with minor injuries. From that point on the Ferrari had it all its own way: the second place car, the Whitehead Aston, was some 100 miles behind on overall distance.

Phil Hill and Olivier Gendebien had babied their Ferrari from the very beginning. As well as limiting their revs to 7000 rpm, the Ferrari's brakes were never left on for more than half a second at speeds over 100 mph. The foot came off the gas at the end of Mulsanne long before any of the others, making use of the Ferrari's high drag factor to slow it more than anything else. Gear changes were never rushed: they downshifted smoothly and methodically. At the end of the 24 hours, the Ferrari, having averaged slightly over 106 mph for 2,547 miles had plenty of brake potential left as well as being in near-perfect mechanical condition. Hill and Gendebien make an excellent team, possessing not only mutual respect for each other's abilities, but both have the intelligence to realize what is needed to make a car finish at Le Mans, then to agree on certain prescribed limitations within which they would drive.

The 1958 race average of 106 miles per hour compares with last year's speed of 113.7 mph. Fastest race lap was again made by Mike Hawthorn in 4 min. 8 sec., compared with his '57 ftd of 3 min. 58.7 in the 4 liter Ferrari. Thus, the FIA 3-liter limit resulted in a considerably slower race than last year, and enthusiasm for Le Mans among drivers sinks lower each year. But the crowds continue to swarm to the Sarthe circuit, and financially it is most interesting for the organizers. It looks like this annual 24 hour circus will be with us for some time to come.

Jesse L. Alexander

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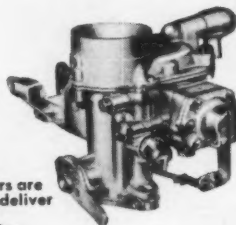


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## The Cars

(Continued from page 50)

The RSK's were given a very clean cockpit outline by a high tonneau cover mating with a rounded, faired engine hatch, and in spite of their (to me) repellent shape they must be very smooth aerodynamically. The same must have been true of the two Oscas, the less obviously streamlined of which walked away with the index honors. It seemed that the Laroche/Radix car, with its small air intake, shrouded front wheels and Lotus-like cockpit, was prepared in France without any actual aerodynamic advice. In relation to the de Tomaso/Davis car it also suffered from "cockpit trouble". The standard Osla in 750 cc form is certainly a beautiful little car, and the first man to run one in the States will own Class H for as long as he chooses.

Streamlining is a perennial feature of the DB's and Panhard Monopols, all of course based on the Panhard flat-twin engine. DB presented two coupes with conventional doors plus two open cars; one (with a Lotus-style cockpit) finished second on index. Unlike some earlier versions these cars have ducted fan cooling, the ducts also embrace and cool the starter and generator. Panhard brought three coupes, two very nicely executed in detail with 300SL-type doors, and one open car which was powered by the sole engine novelty. To shorten pushrod length it had two separate camshafts placed in the extremities of the sump, akin to late BMW flat-twin cycle engines or to the AJB four-barrel. Weird and wonderful carburetor arrangements are to be seen on these cars, from downdraft to sidedraft, from single-throat and twin-throat Solex to twin-throat Zenith (one carb per cylinder!) as used in the new production Porsches.

With only one lame finisher among three cars, Stanguellini had an interesting range of rear end layouts. One car was conventional, with a live rear axle. Another had its gearbox in unit with the engine but had parallel-wishbone rear suspension, while the final finishing car had the same independent rear with a rear-mounted gearbox. Springing at the back in the two latter cars is provided by rubber in tension.

Highly touted in every class from E to H and for the Index prize as well, Lotus took an ignominious last. The 2 liter car and the twin-cam 1 1/2 had wishbone front suspension (like all Lotuses that made the field) and the swing-axle rear suspension. Since these two could have encountered wheel or tire changes, they had wire wheels with Rudge hubs. To try to recoup the 15 or so horses that were lost in the

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original right-angled engine position, the twin-cam Climaxes now lean 17 degrees to the left, while a hood bulge takes care of the exhaust cambox. All the four remaining Lotuses had de Dion rear ends and Chapman's alloy wheels, two having 1100 cc engines and the other two 741 cc. Also in the field was a neat Tojiero-Climax of the latest type, but it retired along with the Lotuses in its class, leaving no finishers in Class G! Too bad Elvas weren't there.

The other Anglo-Saxon stalwart did about as well. It was really something of a comedown for Jaguars, though they have been living on borrowed time designwise for some years. Perhaps we may see the E-Type and a more serious attitude toward racing soon. Privately-entered cars #11 and #57 were production D-Types in general shape, though of course with the new 2987 cc engine, while the Hamilton and Ecurie Ecosse machines had the longer noses and exhaust pipes of ex-works cars. Astonishingly, none were injected.

Some hope was held for the two Lister-Jags, the Belgian car being a 1958 production-type edition complete with strange scoop for rear brake cooling projecting up between the seats. Bruce Halford's dark green #10 was much rougher in finish but had a newer, neater, more compact body shape that bodes of things to come from Brian Lister, who was Major Domo of Bruce's pit. The low finishing spot of #10 is of course a function of a change of camshaft during the race, a spot of work on the gearbox out on the course (and later at the pits), followed by prolonged motoring in third gear only.

There are a couple of Italians who deserve a mention. First it was sad to see a 300S Maserati in the race as a token effort only, no real development having been made on this basically sound car toward the three-liter formula. Let it be said that this was one of the latest 300S's, with the same wide, specially-finned brakes used on the front of the new V-12 sports car. Also entered was one of the sneaky-shaped, Kimberly-type 200SI Masers with a de Dion rear and gearbox in unit with engine. With Maserati, Ferrari, Lotus, Peerless, AC and Porsche all involved, the two-liter class held a lot of interest, but only the last three finished.

Also, that well-known Italian hop-up artist Conrero brought two Alfa Giulietta Sprint Veloces, both bodied by Zagato but in slightly differing styles. The rounded-nosed blue car was shod with Engleberts while the other featured Pirelli Cinturatos. In corners the Belgian tires made more noise, but judging by the downshifts that car wasn't being handled too competently.

Coopers weren't represented this year. John apparently being engrossed with the development of his Grand Prix program, but some Surbiton ideas were obvious in the squared-off tail of the single Renault-based VP. As if to underline the point the front body and fenders looked more Lotus than the Lotus did. Renault 4CV rear suspension was used complete, the engine being moved ahead of the axle and the radiator behind, and a single twin-throat Solex sidedraft carb was fitted. A lot of fun but probably the slowest of the 16 (!) cars entered in Class H.

Two other sidelights on Le Mans: Rain is an ever-present problem and was spe-

(Continued on page 54)

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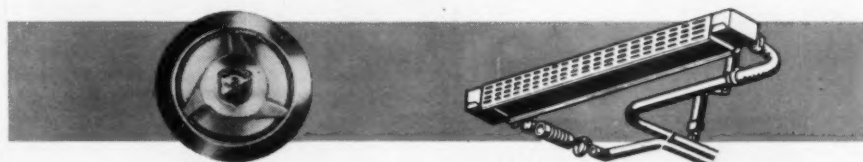
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**Le Mans****The Cars** (Continued from page 50)

cially bothersome this year. Ferrari's rearward-facing carb opening must effectively keep water out of the gasworks, and in the hood scoop of the AC Prototype one could see a deflector which served the same purpose. Some other makes risked an uncontrollable amount of water injection.

In view of the fact that it used the notoriously high Bristol engine, the hood line of the AC Prototype was sweepingly low. Inspection showed that this was done by slinging the vulnerable sump about three inches off the asphalt, a stunt which can be pulled off only at Le Mans — certainly not, say, for the Targa Florio. The Peerless' exhaust system meandered about under the bodywork, giving it a similar ground clearance.

The noise prize this year? Downshifts just in front of the pits for the Dunlop bend were very impressive, and there's real pressure on the eardrums when the DBR1/300's tap is turned on after a corner. Well, as two years ago, that's one that Aston-Martin did take home.

—Karl E. Ludvigsen

**Porsche 1600S**

(Continued from page 25)

In Germany, the most docile model of the line has long been known as the Porsche *Damen*, literally, the Ladies' Porsche. While the earlier Supers have surely exhibited certain feminine characteristics, they could hardly have been called ladies at any time. But since the Carreras are now available for racing purposes, the formerly quixotic, temperamental Supers have been taught their manners and are now thoroughly at home in any road situation — race, rally or even thick traffic.

The flexibility of the latest 1600S engine is astonishing to say the least. It is mainly the twin-choke Zenith carburetors that have taken the sharp, unruly edge off of the old Super and with the substitution of a plain bearing unit for the complex Hirth roller bearing crank, the other major headache of owning a Porsche Super has been eliminated, too. These much less expensive cranks are rugged indeed, so much so that the new 1600 Carrera will also have a plain bearing one. The carbs are the same as on the "normal", but to suit the wilder cam grind considerably larger venturis (28 instead of 24 mm) are used with appropriately changed jets, as well as bigger valves and higher compression ratio.

The green area on the tach (2500 to 5000 rpm on the Super) indicates the range of engine speed suitable for continuous full throttle work; the red area (5000 to 5500) is OK for brief moments, such as accelerating through the gears on level roads. Hanging the tach needle above it for any length of time is needless over-revving, while to open the throttle sharply below the green is lugging it, though that's no longer as serious as it was with the Hirth crank.

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## Porsche 1600S

sumption figures which bear mention. On the German autobahn we cruised at a steady 100 mph with the rev counter riding the 5000 rpm mark. Checking our figures, we found that we averaged 23.8 mpg for an hour at this speed. Not bad indeed. Checking again at 60 mph, the consumption dropped to an almost unbelievable 40.6 mpg. We double-checked our figures and the answers came out the same. This gives you an idea of what to expect under perfect driving conditions with a reasonably light foot; light, yes, but not so light that you can't still enjoy the car's performance. You may not get 40 mpg, but 30-plus should be obtained easily on U.S. turnpikes.

The latest Porsche steering is a real improvement over the first 356A's. Considerably lighter and with quicker return, we found the Ross box to be most satisfactory. From the standpoint of wear on a high speed touring car such as the Porsche, the Michelin X's fitted all around are hard to beat. Handling is satisfactory and though the factory doesn't use the X's, some owners will use nothing else. For competition, drivers will profit by experimentation with various makes and pressures till they find what they themselves like best. No matter what your tastes in handling, the new Porsche allows greater latitude in choice of tires than earlier models ever did.

There are many small but pleasant changes to the latest Porsche, such as rubber stops to keep the doors open when parked on a hill and a smaller, more convenient inside door handle. The seats are outstanding with respect to both the support given the small of the back and the lateral hip-grip. We liked the new gear lever despite the disappearance of the "melted butter" change of the 356's and early 356A's. The lever is more convenient and has a crisper, more solid feel to it. The clutch on the test car was not too happy when getting the car away from rest during acceleration runs. We had recently driven a works 1500 Carrera for a brief spell, and the difference in the two clutches was conspicuous. The Carrera's clutch takes a solid bite right now, unlike the mildly slipping, indecisive unit encountered on the test car. The latter is driven every week by different drivers, we should add, so some wear and tear with perhaps some inadvertent abuse is surely involved.

Brakes are more than adequate for high speed touring, but if you should contemplate competition, keep a watchful eye on them. Dutch-made "Koni" shock absorbers at each corner make a useful substitution, too. They're well thought of in Europe.

In summary, the new 1600 Super Porsche has more steam and is three times smoother than the earlier Supers. With the new engine in the lighter Speedster, well tuned and well driven, we wouldn't be too surprised to see Carreras given a bad time on certain shorter circuits. The Hardtop is an eye-catching model that obviously has a market in colder climes where open cars are practical only in the summer months. The only drawback to each option seems to be a rather hefty price increment. "Best buy" of the line is still the normal Speedster.

Jesse Alexander

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## Porsche

(Continued from page 37)

The gearbox uses the same barrel case featured on the production cars since late '56, the additional fifth gear being carried in a separate box at the end. Within the gearbox proper, the four ratios all use the famous Porsche "Servo-ring" synchromesh invented by Leopold Schmid. Though it can be "beat" in the automotive sense, in everyday language it can't — provided the driver makes an effort to get engine revs *somewhere* in the right neighborhood. Key to the ring's function is a gap which lets it be preloaded. Compressed slightly during assembly, it catches under a lip on the synchronizing dog clutch. Before the shifting fork can move the operating sleeve completely into engagement, the tapered inner surface of the sleeve must ride up on the similarly tapered outer surface of the servo-ring. As the pre-load is taken up, the frictional forces are sufficiently high to bring the servo-ring and the operating sleeve to the same speed.

Brakes are bonded aluminum alloy with steel liners and very fat transverse fins. Though extremely wide and capable looking, these seem to be a weak point, as lengthy pit stops at both Sebring and Le Mans have seen front drums being pulled. Linings by Energit are a compound of steel wool and butyl rubber!

One of the reasons stopping is such a problem is the splendid aerodynamics of the 718. The 10% reduction in frontal area from the RS to the Type 718 and the 5% improvement in penetration have been mentioned before in these pages. In addition, Porsche learned a lesson from EMW/AWE and now they, too, prepare the bodies as if for Bonneville runs.

The frame is some 68 pounds lighter than before. Made up entirely now of small diameter tubes, the greatest saving comes in the complete abandonment of the rear torsion bars and their encircling tube. The upper longerons are shoulder height, giving ample depth. At the cockpit sides where doors are required, X-bracing fills the necessary gap. At the rear, carefully shaped cross members cradle the engine and gearbox, while at the front corners, tubes are omitted in favor of stamped uprights which carry the front torsion bar mounts. It's an interesting reminder that a frame's only purpose is to tie all the *working* components together in a rigid fashion. And the simpler and lighter it can be, the better.

The front suspension is again by twin transverse torsion bars and paired trailing arms. The vertical separation is about 50% greater than on a VW, which should reduce braking loads on the trailing arms appreciably. The upper torsion bar tube is noticeably shorter than the lower one, but it's no longer kinked in the middle. The hydraulic shock absorbers by Fichtel and Sachs are fastened to the bottom trailing arm.

A drawback to the twin trailing arm

layout is the impossibility of arranging steering linkage that does not cause toe-out on bounce and rebound (except with the heavy, complex Dubonnet system). This toe-out is no more welcome at the front than it was at the rear on the first 550, but it's harder to avoid. The divided track rods are unequal, which adds to the confusion. To prevent wheel shimmy, a small steering damper (miniature shock absorbers) is connected to the Pitman arm.

Placed underneath the lower torsion bar, the spare tire projects well forward, the body's rounded nose just curving out to fit. Above, the surface-type oil cooler has been built into what for convenience's sake is called the trunk lid. Actually, the space below it is completely filled by the gas tank. A supplementary oil cooler lies in an air duct along the cockpit floor; both are controlled by a thermostat regulator. An oil tank of about 2½ gallons is mounted in the engine compartment just behind the "passenger's" seat.

Dr. Fuhrmann's engine design features four camshafts which operate through light fingers to reduce side thrust on the large valves. The latter lie at about 90° to one another; so do the spark plugs, though they are offset from each other as well. The cam covers, the paired cylinder heads, and the individual pistons and cylinders are all aluminum. So is the crankcase. It splits on its vertical centerline to accept the built-up Hirth roller bearing crankshaft and a dummy camshaft. The latter drives the oil pump plus four camshafts and four intermediate shafts. All nine shafts connected by bevel gears. No doubt the adjustment of valve timing is not a casual job. Like the Porsche Super, the cylinder walls are chrome-plated and knurled. The artificial irregularities trap oil on the walls, while the chromium provides hardness the aluminum lacks.

When first announced, the Spyder engine released 110 bhp at 7000 rpm. Now the same size engine is poking out 140. With an extra 100 cc's, another ten horsepower is realized. These figures are all DIN and can be maintained for up to five minutes at a time. Over-revving is not easily catastrophic, 8500 having been seen on the tell-tale of cars which subsequently raced and lasted.

Dual ignition in the European sense is used — two plugs per cylinder and two separate distributors. The latter were originally mounted on the ends of the intake (top) cams, but now a bracket next to the end of the crank shaft holds them both in a V position. Carburetion is through two Weber IDM twin-choke down-drafts. No more has been heard of fuel injection since last year.

Engine cooling is of course by air. A belt-driven centrifugal fan of considerable aerodynamic quality does the job. Porsche engineers say it take only eight or nine horsepower to run it. Unsatisfied with even this efficient figure, they have been working since 1953 with a method of cooling which should reduce it to zero. This is not a joke, nor is it a variation on perpetual motion. The exhaust gas of an engine contains plenty of energy; you have only to hold your hand behind the exhaust pipe at full throttle to dis-



## Porsche

cover that. Why not use some of this wasted power instead of taking the hard-earned crankshaft power to blow the cooling air through? Compounding the engine, using an exhaust-driven turbine to run a compressor is a bit too complicated on so small an engine.

But it's on the right track. Patented over fifty years ago, Jet Cooling or perhaps more accurately, the Stream Pump provides the answer. Squirt a garden hose into a shallow puddle and what happens? The water already in the puddle is carried along by the fast moving stream. When this phenomenon is arranged inside a suitable boundaries, the efficiency is startling. Under certain circumstances, one pound of exhaust air can be made to carry along as many as fifteen pounds of fresh cooling air, an ample amount for even the hottest engine.

The drawback? Noise. Think how big a muffler would be required to handle sixteen Spydars at once! Though their engineers have been working on this phase of the problem too, there is a long way yet to go. So far they're said to be too embarrassed to run it, even though it's a racing sports car.

There was a central seater Formula Two Spyder at Rheims this year. Are they ready to leap into Grand Prix racing? They already have the car, the drivers, and even the noise.

Stephen Wilder

## Rallies

(Continued from page 43)

this country . . . and it was around 1950 that the rally began to be something not pertaining to politics. But naturally enough, with traffic conditions and traffic laws as found in the United States, our rallies took shape along the English lines, as opposed to the all-out continental lines. And as certain of the citizenry, not to mention the gendarmerie, failed to be *en rapport* with "those funny little furrin cars" tearing around the back roads, even more stringent time brackets were set up and all specified average speeds were well below posted legal limits.

Meanwhile, rallies were being organized in such far-off places as South Africa and Australia. With no speed-limit problems (the roads themselves took care of that) these events were patterned along the continental European endurance lines . . . and even more so. South African big game provided added thrills to bogged-down Johannesburg enthusiasts, while it was considered par for the course by down-under rallyists to have several cars lose personal bouts with kangaroos in the "Round Australia" run. With natural hazards such as these, plus the unbelievably rugged road conditions — from mountain passes to long stretches of desert, from tropical torrents to dust-choked dry river beds — there was never a reason for stating a minimum time to be taken, it was always a fight for all concerned to get to the finish line with

(Continued on page 58)

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## Rallies

(Continued from page 57)

the car in one piece and to hope that the maximum allowable time wasn't exceeded. That it is possible is proved each year by several entrants... perhaps 5 to 10 crew-and-car combinations make it while 100 to 150 do not. It's that tough.

So much for the bottom of the southern hemisphere. Not to be outdone in any way, the top of the northern hemisphere is also a beehive of rally activity. In the Scandinavian Peninsula, the candidate for international honors is the famous "Rally to the Midnight Sun." The Swedish and Norwegian rugged mountainous terrain, plus an inexhaustible source of ice and snow, make this a "drivers" rally in the best European tradition and that battle is almost always to not exceed the set maximum time allowed... with the problem of arriving "on the nose" being of secondary importance.

In North America, Canada and Alaska follow along the lines of the "Midnight Sun" events but with the being-exactly-on-time feature of much more importance. The geographical references could go on and on as there are indeed "rallies" round the world." It will be much more worthwhile to examine some of the prime examples in a little greater detail.

Probably the two best-known rallies in the world are the championship "Monte Carlo" and "Alpine" events. With a few exceptions, they both have run every year, not counting time out for World War I and World War II. And both were all-out "road races" with every contender trying to make the next checkpoint as early as possible, not only to avoid the "late" penalty, but to gain that extra time for rest and repairs. There has been a big change since 1955, however. Following the Le Mans disaster of that year, French authorities clamped down on speed events of all kinds; especially those run on public roads. The 1955 Alpine Rally was cancelled, as were most of the other scheduled events for the remainder of the year. In 1956, the "Monte" and the "Alpine" both ran... but with new speed maximums set for French roads and with many known or unknown control points provided to catch the unwary contestant running ahead of time and to penalize him severely or even to disqualify him. Thus exact timing became more of a problem than ever before and to this extent, these events (at least while using French roads) became a little more akin to the bigtime English and American rallies. But not too much akin.

The championship continental rallyists have always been race drivers at heart (and in many cases, race drivers in fact) and so if the speeds were held down on the roads, they were upped in the special tests that put the spice into an otherwise possibly bland dish. The 1958 Alpine Rally was a good example of this. The exacting 2800-mile rally route was made up of the highest and most dangerous mountain passes of the Italian, Swiss and French Alps. Added to this were four timed hillclimbs and four speed tests on four famous European race courses. The

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## Rallies

contestants were required to maintain a minimum average of 42 mph of flat courses . . . and on such rapid circuits as the banked bowl at Monza, Italy, a blistering 95 mph average was the slowest acceptable.

In the United States, things were certainly different. Where European crews received rally route-books in advance, and where those with time available practiced on the route as much as possible, the United States rallyists were in the reverse position. In the Sports Car Club of America championship events — and in almost all of the shorter Sunday-afternoon events — instruction sheets were handed to each competing car as they pulled up to the starting line to depart in one-minute intervals. Here, with specified average speeds set by the rally organizers to preclude any violation of posted speed limits, the contestants found they had their hands full just trying to keep to the mandatory average speeds and to *not get lost*. Experienced rallyists everywhere have found that all the fancy watches, calculators and special odometers in the world are useless when the competing car is off course. And so, while American rallies are won by running "to the second", the number one rule is still *don't get lost*.

The editor of the English *Autosport* magazine, Gregor Grant, once said — after a visit to this country — that our rallies must all be organized and sponsored by makers of watches. Because of our placing such importance on rally timing, he had good cause for receiving that impression. But, if this were to be true, then surely we could counter with our opinion that English rallies must surely be sponsored by the makers of maps. For the great majority of British events are of the map-coordinate type. As opposed to the usual rally instruction sheets used over here (1.2 miles — turn right at Heathcliff Place, 2.4 miles — bear left at fork, 4.7 miles — straight ahead onto concrete highway.) English rallyists find their way from point to point by numbered map coordinates. A sample sheet might read like this:

- #1 — M.R. 181/998326
- #2 — M.R. 181/001278
- #3 — M.R. 181/984278

Without the corresponding map, these listings seem just so much gibberish. Actually, they indicate exactly how far up on the map and how far across the map to look for the desired spot . . . much as we in this country use the indexes of our familiar oil-company maps to find that Toadebottom, N.Y., is somewhere near "B-5".

The English maps are of such a scale, and with a great enough number of index lines, that specific spots can be so located within yards. So, English rallyists maintain their average speeds while traveling from town to town and point to point . . . with some of the "points" in extremely tricky places. For example, consider this famous case that was accepted as "cricket" by the organizers and contestants. The desired point to be located and checked-in to, was actually in a cave about 50 feet

(Continued on page 60)



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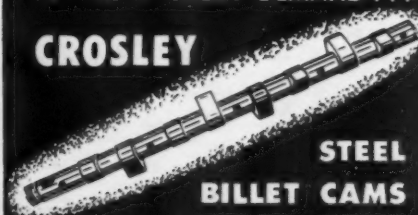
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## Rallies

(Continued from page 59)

below the surface point indicated by the map references. Of course, these index lines could not give information in the third dimension (depth or height) and so great was the frustration until the smarter entrants began exploring the hillside.

Another little gem to plague the British rallyist is that when he finds his point-of-destination on the map, he must then run a "find your own route" rally to that point. And many a fine wavy line on the map, indicating the shortest way via back roads, can be misleading to the point that required average speeds can't be maintained and our sad contestant learns that smarter rallyists have taken the longer but faster way around.

Back in the northern hemisphere, the only North American rally currently on the F.I.A. calendar, since the demise of the famous and popular Great American Mountain Rally, is the Canadian Winter Rally. This provides the European touch of rugged roads and a battle against nature, while still holding to rigid time limits all along the rally route. But . . . lest the impression get around that Canadian rallies are all work and no play, consider these gems excerpted from the supplementary regulations of the 1956 "Rally Quebec". With the full understanding of confusion that arises when a rallyist tries to ask his way of a non-rallyist — they never can understand why the rallyist doesn't know where he's going . . . nor where he's been — a number of handy phrases were printed out in French to assist the many English-only-speaking entrants while traversing the French-Canadian hinterlands:

I realize that this road does not go anywhere.

Je sais que cette route ne mene nulle part.

I do not know where I am going but I must leave now or I will be late.

Je ne sais pas ou je vais mais je dois partir ou je serai en retard.

I know I haven't got a flat tire but I am changing my wheel anyway.

Je sais que je n'ai pas de crevaisson mais je change quand meme de roue.

I am not crazy, I am driving in the Quebec Rally.

Non, je ne suis pas fou, je prends part au Ralliement Quebec.

To conclude, it's only right to describe an ambitious rally project in the making. Up in Fairbanks, Alaska, Polly Johnson, the beauteous president of the Alaska Sports Car Club, is trying to get a co-sponsor in the U.S.A. for an Alcan Highway Rally. In those parts, they think nothing of driving several hundred miles in 30-to-40 below-zero weather to reach the start of an event. So, it's no wonder they "think big." Come to think of it, Alaska will soon be the biggest state in the union and Texas will have to take a back seat on big projects. And if Polly can pull this one off, this Alcan rally will be the first ever run from one state to another and encompass some 1900 miles in the process.

Arthur G Peck

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## Watches

(Continued from page 39)

on the basis of *true time*, and establishing and correcting errors as quickly as possible. The computer used can be a Marschalk, a Stevens or a Blackwell. The latter is not widely used because it does not provide the error-compensation that is required at ten-mile odometer checks.

The one-watch system is very hard on navigators. Computing must be done constantly — as often as every 15 or 20 seconds. The navigator is hunched over his clipboard at all times except for the break or check point where he's given a few moments to relax and check out again. A lot of sharp people claim that this is the only way to run a rally and win it.

Advocates of the second system point out that the one-watch wizards don't always win and that the highly exacting nature of the first system can be self-defeating. So they add one stopwatch to their instrumentation. It works like this:

If you cover the same route that the rally master did and do it at precisely the specified speeds you can compute how long it will take you to travel a given distance or how far you will travel in a given time and, knowing this, you should be right on it — providing you're running with a true Master Watch. Under the second system the single stopwatch is used for timing between speed changes, to determine the error for each interval, do so as promptly as possible, and apply it to the next speed-change interval. Running with just the Master Watch it's difficult to pinpoint your precise stopping point. Using a stopwatch you hit it right on the button. Reach speed change, hit stopwatch; simultaneously make note of Master Watch time, to the second; compute error; restart stopwatch on the next exact minute and second of the Master Watch; account for this minute in new speed change period.

The single stopwatch plus Master Watch system is easier than the one-watch method. In spite of the inferior accuracy of the average stopwatch, the intervals being timed are too short for that to be a factor. And, all stopwatch-based calculations are translated immediately into *true time*, as indicated by the Master Watch.

Rallies are being won with the second system but there are those who feel that it, too, demands an excessive amount of concentrated effort. Hence some successful rallyists consider the third system the easiest and best. It makes use of one Master Watch and two stopwatches. When you come to a speed change you hit the two stop-

(Continued on page 62)


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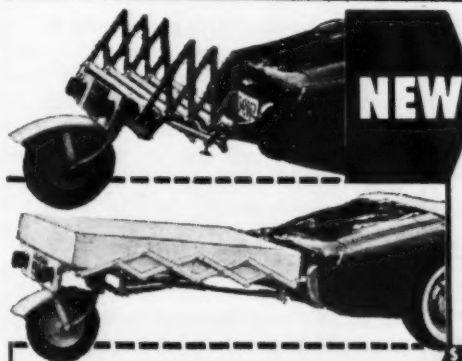


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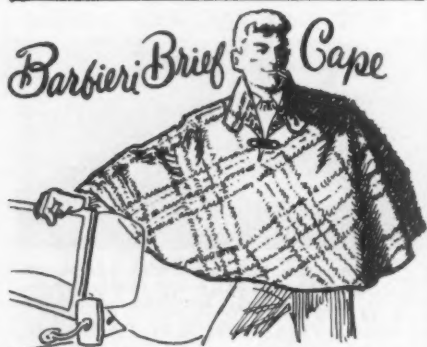
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**Watches**

(Continued from page 61)

watches simultaneously, stopping one and starting the other. In this way you know precisely when the last speed change took place and there is no need to worry about noting the exact position of the Master Watch's hands at the instant that a stopwatch was punched. While you're making your calculations all time on the new speed is being registered. You compute the error on the stopped watch and apply it to the one that's running. At the next speed change you hit the stopwatches simultaneously again.

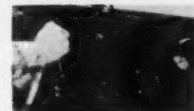
Rallies are being won with each of these timing device combinations and there clearly is no such thing as the system. Don't try to use one that you have to fight with. Choose the one that you can work with most easily because the more easily you can read and compute the more remote the chance of error becomes. We repeat, we are concerned here with the choice and, narrowly, the use of timing instruments. A point-by-point evaluation of stopping the car to zero the odometer, of the virtues of double electric odometers, *et cetera*, is beyond the scope of this article.

In choosing a Master Watch you will do well to get one with a sweep-second hand that can be controlled, because all rallies are run to the second. When you synchronize with the rally master's timepiece you want to be able to zero out to the second; this is common knowledge. When you are marked out at the beginning of a rally you want to be positive that you are in dead synch with the watch that decides the winner.

Many chronometers and some chronographs are what the trade calls "hack watches." With these you pull out the winding stem and the balance wheel is "hacked" or braked to a complete stop at that precise point. Say you're due to start on the even minute. You set your sweepsecond on zero and your minute hand one minute beyond the time shown on the rally master's watch. Your watch's movement is stopped and you wait until the sweepsecond of the key watch hits zero. You press your watch's stem and are in synch with the main timer. It's good to practice this and also to verify, some time before starting, that your watch and the rally master's stay in synch.

All watches are somewhat unsteady until they hit a stride, a beat, a rhythm. Therefore, synch your watch as early as possible so that it can get its beat and keep it. After synchronizing, put it in the position it's going to be in during the rally and try not to alter that position at any time. In other positions the watch's performance can change

(Continued on page 63)

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## Watches

enough to cause errors that can confound thoroughly your most careful calculations.

This applies to stopwatches as well as to Master Watches. It's a good idea, with any timepiece that's going to be doing a critical job, to have it timed out on an electronic timer before starting on a rally. Many watchmakers are glad to do this as a courtesy and they often find that a slight adjustment is needed to bring the watch up to snuff. First, decide upon the position in which the instrument is going to be used — the type of board or holder it will be mounted on. Then call this to the watchmaker's attention. By means of the electronic timer he can adjust it in any position. This is the sort of n-th degree preparation that sorts out the contenders.

Art Peck had made an exhaustive study of timers best suited to rally use and he makes specific recommendations. He states that probably the most universally accepted stopwatch among rallyists is Minerva's 107H, ideal for timing 12-hour rallies. Its accuracy is good and its pressure-resistant fly-back pushbutton limits inadvertent clearing of the watch. Minerva's 111H is identical except that its 60-second dial is divided into 1/100ths for those who prefer decimal calibration.

For time-of-day readings Minerva's 350R is excellent. It is accurate, very legible, and its sweepband is easy to adjust.

One of the most easily-read stopwatches in the industry is Minerva's 107N. It goes far in eliminating the common errors that crop up in the reading of accumulated-time registers on timers of traditional design.

Where only one stopwatch is being used in conjunction with the Master Watch, Peck's favorite for individual leg timing is Minerva's 105PN because it has all of the readability of the 107N and, with the time-out slide, can be cleared and re-started instantaneously with one punch of the crown.

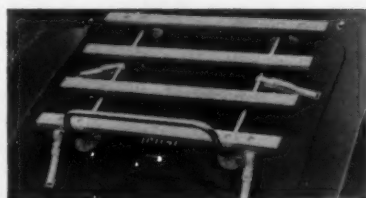
Minerva's 1015 clipboard, while made for industrial time studies, is a natural for rally use. With its adjustable plungers it is possible to set up a variety of actions when the lever is pushed. A typical setup is placement of a time-of-day watch on the left, with that plunger disconnected. The center and right-hand holders carry watches of the 107N type so that at the end of any given leg the #1 leg watch is stopped at the same instant that the #2 leg watch is started... with one motion of the lever.

Where expense is no object, Peck recommends keeping the time-of-day watch in another location, with three 107N watches in the clipboard. Two of

(Continued on page 65)

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## Watches

(Continued from page 63)

these are used as regular leg timers, while the third serves as a five minute pre-set watch for those unpleasant occasions when a speed-change point is reached too late.

In the pocket chronograph field Peck has found that Longines' split-second 45T is ideal for his race-announcing and rally work. In wrist chronographs his experience has led to the emphatic selection of the Breitling (Wakmann) 783AV, for accuracy and legibility. He feels that these, plus Minerva's 107N or 105PN, give a complete solution to the rallyist's timing problems.

Minerva has been outstanding in serving the needs of motor sport enthusiasts in this country for a great many years. But in Europe, Heuer has studied and served their interests as no other manufacturer has.

Heuer's automotive line is carefully-studied, complete, and magnificent in its presentation. All of this firm's automotive timers have black dials, luminous numerals, and are mounted in handsomely machined cases, on mounting plates, with all external metal parts finished in heavy chrome. Their crowns are deeply knurled for easy winding and their pushbuttons are large for easy operation with gloved hands.

Heuer's stopwatches have seven-jewelled lever movements and are competitive in quality with other makes having the same specification. Their higher price is accounted for by their finer packaging.

First is the Auto-Rallye, a 60-second, 60-minute timer. It compares with the Minerva 105 and 107 for legibility. Next is the Autavia which is basically of the same design as the popular Minerva 107H, and is also available with tachometer dial with mile or kilometer bases.

Next is Heuer's time-of-day watch, the 15-jewel Hervue, with dial and case to match its automotive companions. And then comes the Super-Autavia dashboard chronograph, a high-quality 17-jewel instrument. It is a splendid navigational timepiece. It provides two distinct timing systems: normal and recording. Any interval up to 30 minutes is recorded to the nearest fifth-second by means of a large red sweep-hand. For recording periods up to 12 hours the outer ring is revolved until the red triangle is opposite the red tip of the hour hand. Elapsed time can be read from the accumulated hour to the fifth-second. It also has the valuable back-watch feature.

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(Continued on page 66)

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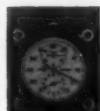
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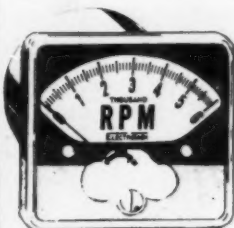


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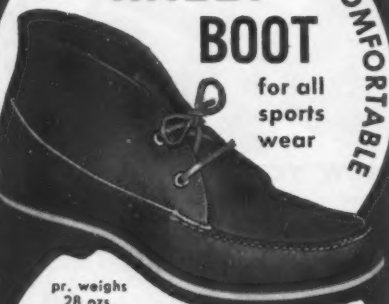
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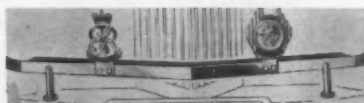
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BOX 54

### Watches

(Continued from page 65)

watches: the Ring Master. Basically it is a standard fifth-second stopwatch. But it has seven easily interchangeable dials that adapt it to practically all fields of sport, industry and science.

Among these are the best timing tools and techniques for rallyists. There is no single, universally-right combination but one of the three systems cited should be the right one for you. With each, accurate timing to the second is possible. Without this, in a rally, you might as well specialize in moonlight drives.

Griff Borgeson

**T**HERE'S probably no sport in the whole wide world as difficult to time accurately as a sports car rally. This becomes apparent when it is realized that even the short Sunday afternoon small-club event utilizes 3 or 4 checkpoints along with the start and finish—and each location must be of equal time accuracy. Then multiply this problem by four for a long, championship-type rally and the problem is staggering—especially when checkpoints are separated by miles, are often located in the loneliest of back-road sections and may operate in the heat of day and then into the cold of night. The job of procuring 20 or so "master watches" is difficult, if not down right impossible. It's no wonder that the best brains of the best rally chairmen have been worked overtime for a way out.

The way out has been the utilization of the wireless. While not in the scope of this article, SCI feels that the complete timing story should contain a brief mention of rally-radio. For several years, now, eastern clubs have been placing short-wave receivers at rally control points. With these receivers tuned to time signals sent out from the United States Bureau of Standards (WV) or the Canadian Dominion Observatory (CHU), absolute results can be guaranteed as every watch may be kept in perfect synchronization with time-of-day.

Rallyists, too, jumped on the beep band wagon and installed short-wave converters (such as the CGS Rally-Verter) on their car radios. Now eastern rally masters so equipped roam rally courses, able to double check all non-radio checkpoints.

Frequencies used on WV are 2.5 mc, 5.0 mc, and 10.0 mc. CHU uses 3,330 kc, 7,335 kc, and 14,670 kc. Conditions vary with the time of day and the part of the country but, in general, the most popular frequencies are 5.0 mc for WV and 7335 kc for CHU. If the reception is equal on both stations, then CHU is recommended because each minute is identified by voice transmission while WV only does so each 5 minutes.

In these modern rally times, it is now almost automatic that eastern clubs will have radio beeps available, along with the master watch, at the starting line, and in SCCA national rally competition, this is a standard part of the regulations.

And so with good watches, backed by the short-wave time signals, the days of "who's time was off" is a thing of the past.

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KILGORE, TEXAS S. H. Motors Corp.  
LAGRANGE, ILLINOIS Oil Belt Motor Co.  
LAKE CHARLES, LA. Bower Motors Inc.  
LOS ANGELES, CALIF. W. E. Delatelle  
MANCHESTER, N. H. Moench-Davis Imported Cars  
MILLWOOD, NEW YORK Merrimack St. Garage  
MINNEAPOLIS, MINN. Dwight Broembs European Cars  
MILWAUKEE, WISC. Cross Country Motors  
MONROVIA, CALIFORNIA P. J. Kaufman  
MONTREAL, CANADA Clifford T. Nutt  
MOORESTOWN, NEW JERSEY Auto France Ltd.  
MOUNT KISCO, NEW YORK Lloyd & Lewis  
NEW BURG, N. Y. Milano Motors  
NEW HAVEN, CONN. B. J. York Motors  
NORTH HOLLYWOOD, CALIF. Continental Autos Ltd.  
NEW ROCHELLE, N. Y. Rancho Motors  
NEW YORK, NEW YORK Julius E. Mayer  
NEW YORK, NEW YORK Citroën Cars Corp.  
NORMAN, OKLAHOMA Overseas Motors  
NORTH OLMSTEAD, OHIO Automobile Imports Ltd.  
OLATHE, KANSAS Citroën Auto Sales  
OKLAHOMA CITY, OKLA. Bud Billings Motor Co.  
OKLAHOMA CITY, OKLA. Laketown Auto Sales Inc.  
OXNARD, CALIFORNIA Leveridge Motors  
PEORIA, ILL. Barlow Motor Co.  
PHILADELPHIA, PA. L. M. Hopkins  
PHOENIX, ARIZONA Haddon & Williams  
PITTSBURGH, PA. Brecheisen European Motors  
POMONA, CALIF. S. H. Motors Corp.  
PONTIAC, MICHIGAN Pomona Valley Motors Inc.  
PORTLAND, OREGON Foster Garage  
POTTSVILLE, N. Y. Economy Car Imports  
RICHMOND, INDIANA Walter Trautmann  
ROCHESTER, NEW YORK Chenoweth-Cadillac  
ROCKFORD, ILL. Churchill Motors  
SAN ANTONIO, TEXAS Shanahan & White  
SAN FERNANDO, CALIF. Lone Star Motor Import Inc.  
SAN FRANCISCO, CALIF. Hammer Motors Inc.  
SANTA ANA, CALIF. Executive Motors Inc.  
SANTA CLARA (El Camino), CALIF. Monte E. Peters Co.  
SHERBURNE, N. Y. G. F. Bacon  
SOUTHAMPTON, L. I., N. Y. Carl A. Borrenson Imported Cars  
SOUTH PASADENA, CALIF. Le Cann Brothers  
SPRINGFIELD, ORE. Campbell Motors  
SPRINGFIELD, WIS. French Motor Cars  
ST. LOUIS, MISSOURI Richardson Pontiac  
ST. PETERSBURG, FLORIDA Spooner Motors  
STAMFORD, CONN. Beach Motors  
STOCKTON, CALIFORNIA Colonial Cadillac Inc.  
SYRACUSE, N. Y. Hi-Grade Auto  
TEMPLE, PENNSYLVANIA Cain Motor Sales  
TUCSON, ARIZONA Spanglers Motors  
TULSA, OKLAHOMA Fergusson Motors  
UTICA, NEW YORK Empire Motors  
UTICA, MICHIGAN Nelson Foreign Car Co.  
VENTURA, CALIFORNIA Reliable Auto Service  
VESTAL, N. Y. Foster Imported Motors  
WARREN, OHIO Henry Carroll Inc.  
WATERBURY, CONN. Mahan's Imported Autos  
WEST HOLLYWOOD, CALIF. The Imports Motors Inc.  
WEST PALM BEACH, FLA. Challenger Motors  
WESTPORT, CONN. Bruce W. Strong  
WEST ROXBURY, MASS. Westport Auto Sales  
WHITE PLAINS, N. Y. Thompson Buick  
WICHITA FALLS, TEXAS Fitzpatrick Pontiac Inc.  
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